

Pennsylvania Game Commission

Wildlife Notes

Envirothon students will be able to identify the animals described in the Wildlife Notes listed below.

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| 4. Blackbirds, Orioles, Cowbird, and Starling | 30. Owls |
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Wildlife Note — 35
LDR0103

Bats

by Chuck Fergus

Bats are the only mammals that fly. Their wings are thin membranes of skin stretched from fore to hind legs, and from hind legs to tail. The name of their order, Chiroptera, means “hand-winged.” Their long, slender finger bones act as wing struts, stretching the skin taut for flying; closed, they fold the wings alongside the body.

Pennsylvania bats range in size from the hoary bat (length, 5.1 - 5.9 inches; wingspread, 14.6 - 16.4 inches; weight, 0.88 - 1.58 ounces) to the pygmy bat, or pipistrelle (length, 2.9 - 3.5 inches; wingspread, 8.1 - 10.1 inches; weight, 0.14 - 0.25 ounces). Nine species of bats occur in Pennsylvania; two others are rare visitors from the South.

All Pennsylvania bats belong to family Vespertilionidae, and are also known as evening bats or common bats. They are insect eaters, taking prey on the wing. Often they feed over water, and some species occasionally land and seize prey on the ground. A bat consumes up to 25 percent of its weight at a single feeding.

The eyes of our bats are relatively small, but their ears are large and well developed. Bats can see quite well, but unique adaptations help them fly and catch prey in total darkness. While in flight, a bat utters a series of high-pitched squeaks (so high, in fact, they are almost always inaudible to humans), which echo off nearby objects — bushes, fences, branches, insects — and bounce back to the bat's ears. These sound pulses may be only 2.5 milliseconds in duration. Split-second reflexes help the creature change flight direction to dodge obstructions or intercept prey.

A bat will use its mouth to scoop a small insect out of the air. A larger insect is often disabled with a quick bite, cradled in a basket formed by the wings and tail, and carried to the ground or to a perch for eating. If an insect takes last second evasive action, the bat may flick out a wing, nab its prey, and draw the insect back to its mouth. Bats have sharp teeth to chew their food into tiny, easily digested pieces.

Most bats mate in late summer or early fall, although some breed in winter. The male's sperm is stored in the female's reproductive system until spring, when fertilization occurs.

The young, born in summer, are naked, blind and helpless. They are nursed by their mothers and by six weeks of age, most are self-sufficient and nearly adult size.

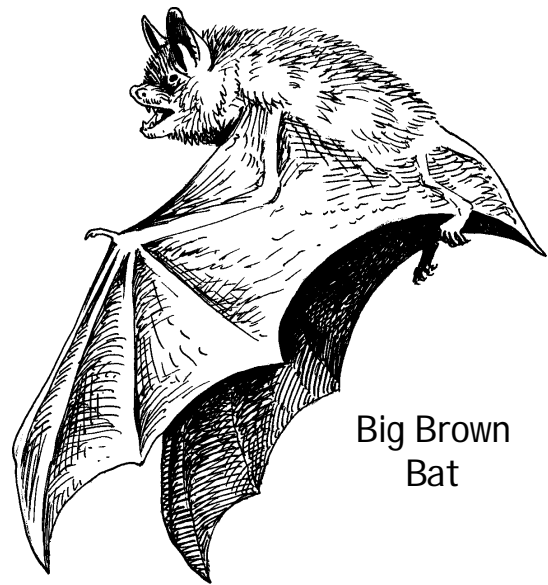
The reproductive potential of bats is low. Most bats, including the smaller species, usually bear a single young per year; the larger species may have up to four. There is only one litter per year.

None of Pennsylvania's bats fly during the brighter hours of daylight, preferring to make their feeding flights in late afternoon, evening and early morning. However, it's not unusual to see a bat flying during the day. Roost disturbance and heat stress may cause bats to take wing during daylight hours. During the day, they roost — singly, in pairs, in small groups, or in large concentrations, depending on the species. They seek out dark, secluded spots such as caves, hollow trees and rock crevices. They may also congregate in vacant buildings, barns, church steeples and attics; some hide among the leaves of trees. They hang upside down, by their feet.

In fall, winter and early spring, insects are not readily available to bats in Pennsylvania and other northern states. At this time, three species migrate south; six others hibernate underground, usually in caves.

Bats are true hibernators. Throughout winter, they eat nothing, surviving by slowly burning fat accumulated during summer. A hibernating bat's body temperature drops close to the air temperature; respiration and heart-beat slow; and certain changes occur in the blood. Bats can be roused fairly easily from hibernation, and often are able to fly 10 to 15 minutes after being handled. Most favor cave zones having the lowest stable temperature above freezing. During winter, bats may awaken and move about within a cave to zones of more optimum temperature. In many caves, bats of several species hibernate together.

Perhaps because of their nocturnal nature, secretive habits and unique appearance — not to mention superstitions — bats have long been misunderstood and sometimes feared, and many misconceptions exist about them. They include: Bats are prone to rabies; their drop-



Big Brown
Bat

pings are a dangerous source of tuberculosis and other diseases; they are aggressive and often attack people; they are dirty and ridden with lice.

Bats are no more apt to contract rabies than other warm-blooded animals. (People should not, however, handle bats, especially those found on the ground or in the open during the day.) There is no evidence to suggest that bats — or their droppings, called “guano” — transmit tuberculosis to man. A host of scientific studies indicate that healthy bats do not attack people, and even rabid bats rarely become aggressive. Bats need to keep themselves extremely clean to fly. They host no more parasites than other animals, and parasites that do afflict bats are very specialized and rarely pose problems to humans. Histoplasmosis, caused by a soil fungus that can grow in accumulated bird and bat droppings, does not, as a rule, survive in hot dry attics. However, as a precaution, it's recommended that you wear a respirator when stirring up dust in bat quarters or cleaning out large accumulations of droppings.

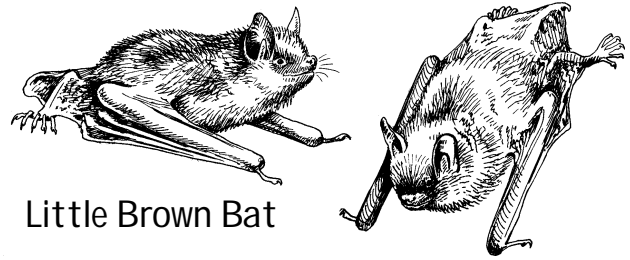
The colonial bats may congregate at favorite roosting sites, often in buildings. While these bats do no real harm to human occupants, their droppings, odor and noise may become a nuisance. To exclude bats correctly may take two years. The first summer you should watch the home at dusk to see where the bats are exiting. Try to get a count of the number of bats. If possible, erect a well-placed bat box of good design before August. The box should be large enough to accommodate the bats you plan to evict. When the bats leave in the fall, seal all entrances. Next spring, when they return, they are likely to move into the bat box, rather than search for a new way into your home, or your neighbor's. Do not seal bats out during June or July because you will trap flightless young inside.

Exterminating is a questionable practice. Poisons used on bats can be dangerous to humans, and may cause sickened bats to scatter and fall to the ground, where they are more likely to come into contact with people and pets. Currently no pesticides are approved for use on bats. Reputable pest control operators use bat exclusion techniques.

To counterbalance their low reproductive rates, bats are relatively long-lived. Some have been banded, released and recaptured more than 30 years later. Because they feed in mid-air and are active at dusk and at night, bats are not often caught by predators. Owls and hawks take some, as do housecats, raccoons and foxes. Rat snakes occasionally eat roosting bats. Other causes of mortality include cave floodings and accidents.

The greatest threat to bats comes from humans. In winter, hibernating bats may be aroused by people exploring caves; repeated disturbances force bats to squander precious calories needed for overwintering. Caves may be flooded by dams, or dynamited shut. Some scientists suspect that widespread use of pesticides also harms bat populations.

Little Brown Bat (*Myotis lucifugus*) — Pennsylvania's most common bat, the little brown, is found statewide. Length, including tail, is 3.1 - 3.7 inches; wingspread, 8.6 - 10.5 inches; weight ranges from 0.25 - 0.35 ounces,



Little Brown Bat

Indiana Bat

and is greatest just before hibernation. Females are slightly larger than males. Color: a rich brown approaching bronze, usually with a dark spot on the shoulders. The fur is dense, fine and glossy; the wings are black and bare.

This bat eats a wide variety of flying insects, including nocturnal moths, bugs, beetles, flies and mosquitoes. Insects are regularly caught with the wing or tail membrane, and transferred to the mouth. An individual emerges from its day roost at dusk, and usually seeks a body of water, where it skims the surface for a drink, and then hunts insects. Bats examined within an hour of taking flight often have full stomachs weighing one-fifth of their body weight. The little brown bat makes several feeding flights each night, and is capable of catching 1,200 insects per hour. A nursing female may eat her own weight in insects nightly.

In October and November, bats leave their summer roosts and move to tunnels, mine shafts and caves. Here, clinging to the ceilings and clustered against one another, they hibernate, until they emerge in April and May. They return to the same hibernation and summer roost sites year after year.

Females disperse from the hibernation roosts and gather in summer nursery colonies of just a few to 1,000 or more individuals in attics, barns and other dark, hot retreats. Males are solitary, roosting in hollow trees, under loose bark, behind loose siding and shingles and in rock crevices.

A single young is born to each female in June or early July. After four weeks, the young bat is fully grown, and ready to leave the colony. Females mature sexually at about 8 months of age, while males mature in their second summer. Little brown bats may live more than 30 years.

Indiana Bat (*Myotis sodalis*) — The Indiana bat resembles the little brown bat, but has a pinkish cast to its fur, giving it a light purple-brown coloration. Length, 2.9 - 3.7 inches; wingspread, 9.4 - 10.3 inches; weight, 0.18 - 0.28 ounces. Sexes are equal in size.

Indiana bats probably roost in trees in summer; and they do not commonly roost in buildings. In winter, some 97 percent of the total species population hibernates in certain large caves in Missouri, Kentucky, Indiana and Illinois. Pennsylvania is on the fringe of the species' range. Indiana bats have been found wintering in 12 sites (caves, as well as abandoned mines and railroad tunnels), and are monitored regularly by the Game Commission, and it is on the federal endangered species list.

The Indiana bat hibernates in clusters of about 250

bats per square foot on the ceilings and side walls of caves. In this formation, it is vulnerable to disturbance by cave explorers: when a bat on the edge of the cluster is awakened, it moves about, starting a ripple of activity that spreads throughout the group. A winter of repeated disturbances causes bats to burn vital fat stores, and they may run out of energy before spring.

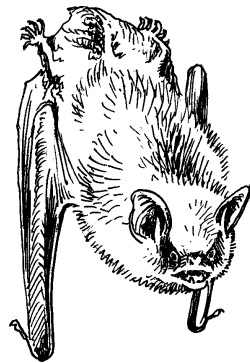
Females of this species are believed to bear a single young in late June. Feeding habits are probably similar to those of the little brown bat.

Northern Long-Eared Bat (*Myotis septentrionalis*) — Similar in size and color to the little brown bat, the northern long-eared bat may be distinguished by its longer tail and narrower and longer ears. It ranges in forested areas throughout the state, but is much less common than the little brown bat; its distribution is considered local and irregular. Length, 3.0 - 3.7 inches; wingspread, 9.0 - 10.7 inches; weight, 0.25 - 0.32 ounces.

Biologists have learned little of the ecology and behavior of the northern long-eared bat, although they suspect feeding habits are similar to those of the little brown. Long-eared bats roost singly or in small colonies in caves, behind window shutters, under loose tree bark and in cliff crevices. Females gather in nursery colonies in attics, barns and tree cavities. Probably a single young is born in July. Long-eared bats return to caves in fall, often sharing space with little brown bats, big brown bats and pipistrelle bats.



Northern
Long-eared
Bat



Small Footed Bat

Small-Footed Bat (*Myotis leibii*) — Also known as Leib's bat, this species is one of the smallest in North America: length, 2.8 - 3.3 inches; wingspread, 8.3 - 9.7 inches; weight, 0.18 - 0.28 ounces. As the name implies, it has a very small foot when compared with other bats. When viewed from the front, the bat has a distinct black mask that stretches from ear tip to ear tip. In Pennsylvania, it is rare, and the population is thought to be decreasing; it is classified as a threatened species on the state list. Very little is known about this bat's summer habitat and lifestyle.

The small-footed bat resembles the little brown bat, but has a golden tint to its fur. Feeding and breeding habits probably parallel those of the other small, closely re-

lated bats. The small-footed bat waits until November to enter caves for hibernating, and emerges in March. It hibernates in narrow cracks in the wall, floor or roof, singly and in groups of up to 50 or more. It usually stays close to entrances where the temperature is just above freezing.

Silver-haired
Bat



Eastern
Pipistrelle

Silver-Haired Bat (*Lasionycteris noctivagans*) — A medium-size bat: length, 3.7 - 4.5 inches; wingspread, 10.5 - 12.1 inches; weight, 0.25 - 0.35 ounces. The fur is soft and long; the sexes are colored alike, blackish-brown tipped with white, for a bright, frosted appearance.

The silver-haired bat inhabits wooded areas bordering lakes and streams. It roosts in dense foliage, behind loose bark, or in a hollow tree — rarely in a cave. It begins feeding earlier than most bats, often before sunset. Silver-haired bats do not hibernate in Pennsylvania, migrating farther south. In summer, a few may breed in the cooler, mountainous sections of the state, but most go farther north.

Eastern Pipistrelle (*Pipistrellus subflavus*) — The pipistrelle is also called the pygmy bat because of its small size: length, 2.9 - 3.5 inches; wingspread, 8.1 - 10.1 inches; weight, 0.14 - 0.25 ounces. Its fur is yellowish brown, darker on the back. The back hairs are tricolored: gray at the base, then a band of yellowish brown, and dark brown at the tip.

Pipistrelles take wing early in the evening and make short, elliptical flights at treetop level. In summer, they inhabit open woods near water, rock or cliff crevices, buildings and caves. They hibernate from September through April or early May, deep inside caves and away from the openings, in zones where the temperature is about 52 to 55 F. They sleep soundly, often dangling in the same spot for months.

Pipistrelles eat flies, grain moths and other insects.

They breed in November, and young — usually two per litter — are born in June or July. Pipistrelles live up to 15 years, and are found throughout Pennsylvania, except in the southeastern corner.

Big Brown Bat (*Eptesicus fuscus*) — Second in size to the hoary bat, the big brown is 4.1 - 4.8 inches long; wing-spread, 12.1 - 12.9 inches; weight, 0.42 - 0.56 ounces. The fur is dark brown, and the face, ears and flight membranes are blackish. This common bat ranges throughout the state in diverse habitats: attics, belfries, barns, hollow trees, behind doors and shutters, in city and country.

Big brown bats fly at dusk, and generally use the same feeding grounds each night. They fly in a nearly straight course 20 - 30 feet in the air, often emitting an audible chatter. Major foods include beetles and true bugs (junebugs, stinkbugs and leafhoppers) many of which are major agricultural pests. A colony of 150 big brown bats can eat enough cucumber beetles during the summer to protect farmers from 18 million rootworm larvae.

Among the last bats to enter hibernation, big brown bats seek out caves, buildings, mines and storm sewers in October, November or December. They hang close to the mouths of caves, and emerge in March and April. Females bear young in June, usually two per litter. As young mature and leave the nursery colony, adult males enter and take up residence. Big brown bats have lived up to 19 years in the wild.

Red Bat (*Lasiurus borealis*) — A bright rusty coat and long, pointed wings distinguish this species. Length is 3.7 - 4.8 inches; wingspread, 11.3 - 12.9 inches; and weight, 0.28 - 0.49 ounces. Individuals roost singly in trees (except for females with young), often on forest edges, in hedgerows, and shrubby borders; they seem to prefer American elms. Rarely do they use caves or buildings.

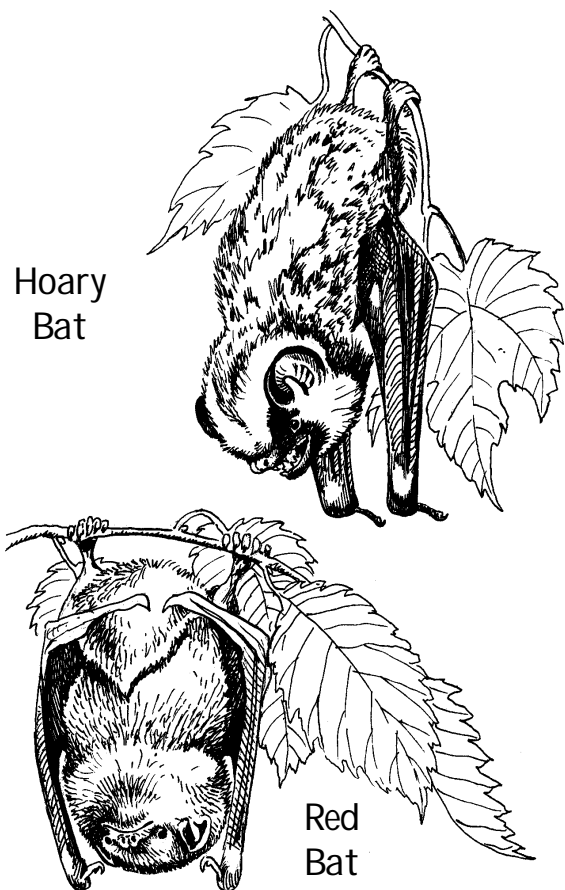
Red bats start flying early in the evening, preying on moths, flies, bugs, beetles, crickets and cicadas, which they take from air, foliage and ground. Strong fliers, red bats are considered migratory, although little is known about their patterns. The sexes may migrate separately. Red bats start south in September or October, flying at night. They can withstand body temperatures as low as 23 F.

Females bear 1 - 5 young (usually 2 - 3) in their tree-top roosts. For the first few days, the young remain clinging to their mother when she flies out on hunts. Young are able to fly at 3 - 4 weeks, and are weaned when 5 - 6 weeks old. Longevity is about 12 years. The red bat ranges across Pennsylvania.

Hoary Bat (*Lasiurus cinereus*) — The largest bat of the Eastern forests, the hoary is 5.1 - 5.9 inches long; has a 14.6 - 16.4-inch wingspread; and weighs 0.88 - 1.58 ounces. The fur is dark brown, heavily tinged and white. The species ranges across the state, but is uncommon.

Hoary bats roost in trees — they prefer conifers, but also use deciduous trees — in woods, forest edges and farmland. They choose protected sites 12 - 40 feet above the ground. Strong, swift fliers, they take to the air later than most other bats. They prey mostly on moths, but also take beetles and mosquitoes.

Hoary bats migrate to warmer climates in winter. In



spring, they return and raise young. The young are born from mid-May to early July, usually two to a litter. Females have two pairs of breasts and sometimes have three or four pups in a litter. The female gives birth while hanging in a tree. Young grow rapidly and are able to fend for themselves in about a month.

Note: The Seminole Bat (*Lasiurus seminolus*) and Evening Bat (*Nycticeius humeralis*) have been found a few times in Pennsylvania, but are not considered regular residents.

Homeowners having problems with bats may request the booklet, *A Homeowner's Guide to Northeastern Bats and Bat Problems*, by Lisa M. Williams-Witmer and Margaret C. Brittingham, Publication Distribution Center, Pennsylvania State University, 112 Agricultural Administration Building, University Park, PA 16802. A video, *The Season of the Bat*, is available from: Wild Resource Conservation Fund, P.O. Box 8764, Harrisburg, PA 17105-8764 (Phone — 717-783-1639).

Wildlife Notes are available from the
Pennsylvania Game Commission
Bureau of Information and Education
Dept. MS, 2001 Elmerton Avenue
Harrisburg, PA 17110-9797
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Wildlife Note — 29

Black Bear

by Chuck Fergus

One of Pennsylvania's premier big game animals is the black bear, *Ursus americanus*. The species ranges through much of forested North America from Mexico to Alaska and from Florida to northern Canada. In different regions, black bears exhibit different life patterns, denning times, tolerance of human activity, habitat preferences, home range, reproduction behavior, pelt coloration and even size and weight.

Biology

Bears are powerfully built animals. Adults are 50 to 85 inches in length, including a three- to five-inch tail. They stand about 30 inches at the shoulder and weights range from 140 to 400 pounds, with some individuals weighing more than 800 pounds. Males, sometimes called boars, tend to be considerably larger and heavier than females (sows).

Most Pennsylvania bears are black, although a few are

cinnamon-color. (In other parts of its range, *Ursus americanus* may be brown, whitish, or bluish-gray, but the majority are black.) The body is glossy black, the muzzle tinged with tan. Often a bear will have on its chest a white mark, sometimes in a prominent "V." The fur is thick, long and fairly soft. Sexes are colored alike.

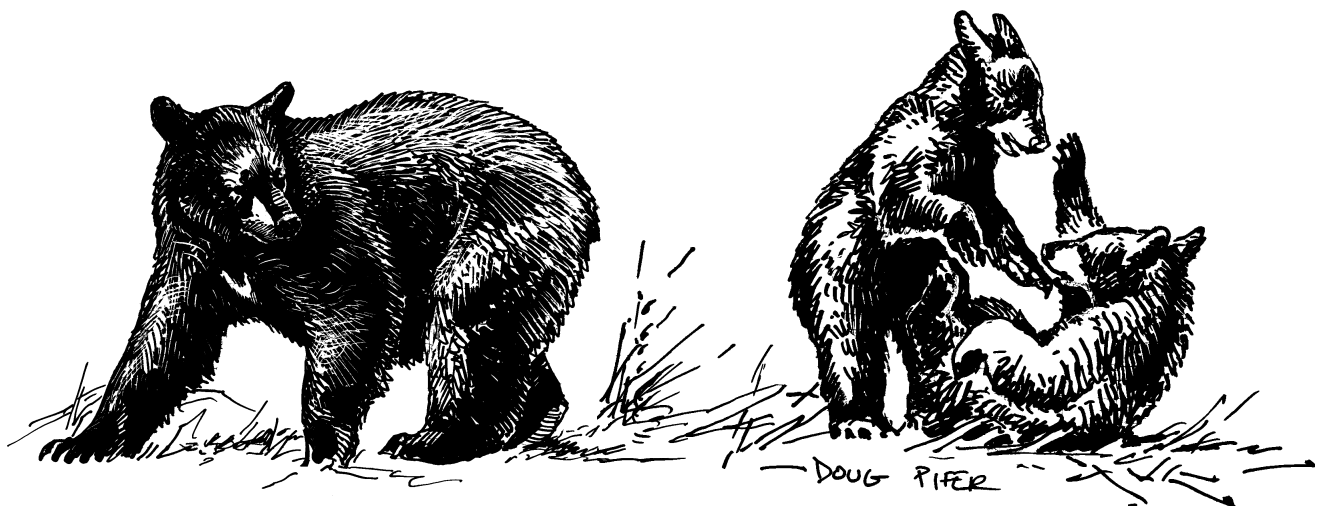
Bears walk in a shuffling, flat-footed manner. Each foot has five toes, each with a curved claw. Extremely agile for their size, bears sometimes stand erect on their hind feet to see and smell better. Top speed is 30 miles per hour over a short distance. Black bears climb easily and swim well.

Black bears have an acute sense of smell, but their vision is poor. Hearing is not believed to be acute. They occasionally growl or "woof," and when injured, sob and bawl. Sows communicate to their cubs with low grunts, huffs and mumbles.

Bears are mainly nocturnal, but they sometimes feed and travel by day. Alert and wary, they tend to avoid open areas. Individuals are solitary. While most bears will run from a human, a female with cubs should be respected, and on rare occasions might actually attack if she feels her young are in danger. Bears that become accustomed to humans (as in a park or garbage dump setting) are less likely to run away, making them potentially much more dangerous.

Bears find food mainly by scent. They are opportunistic feeders, with a largely vegetarian diet. Common foods are fruit (including large amounts of many kinds of berries), mast (acorns and beechnuts), succulent leaves of hardwoods, grasses, insects (including eggs and larvae), plant roots, amphibians, reptiles, small mammals, fish, carrion and garbage. An occasional bear runs afoul of humans by preying on pigs, goats or sheep; by eating corn; by raiding campers' food stores; and by destroying honeybee colonies (beekeepers with such problems should protect their hives with electric fences). Bears drink water frequently, and in hot weather they wallow in streams.

In autumn, bears eat heavily to fatten themselves for winter. The winter den may be a hollow tree or log, an excavation or a crevice in a rock ledge; it may be a "nest" on top of the ground, or under fallen trees or brush, in a cavity under a large rock or beneath the roots of a tree; or it may be in a drainage culvert or a depression dug in



the ground. Some bears line their dens with bark, grasses or leaves. Females often select more sheltered sites than males. Males den alone, as do pregnant females (they give birth in the den). Females with first-year cubs den with their young.

In winter, bears den up and become dormant. They lapse into and out of a deep sleep, from which they may be roused. Body temperature is not drastically reduced. Respiration and heart rate might decline noticeably. They do not urinate or defecate while dormant. Bears in poor condition den for shorter periods than those in better shape. On warm, late-winter days, they may emerge to look for food.

In some areas, bears create trails while covering the nightly circuits they run. Individuals may scar prominent trees with claw and tooth marks; these "bear trees" may mark a territory or signal availability during mating season.

Bears mate from early June to mid-July. It is generally accepted that they are polygamous. The male does not help rear young.

Females give birth to cubs in January while in the winter den. Litter sizes range from one to five, with three most frequent in Pennsylvania. Newborns are covered with fine dark hair, through which their pink skin shows. They are about nine inches long and weigh 10 to 16 ounces. Their eyes and ears are closed.

Cubs nurse in the den. After about six weeks, their eyes open. In about two more weeks, they walk. They leave the den when three months old, are weaned by seven months, and by fall usually weigh 60-100 pounds. Bears traveling in groups in autumn are usually females and their cubs.

Cubs are playful, romping in water and wrestling with their lit-



termates. The female protects them, sending them up trees if danger threatens. Males occasionally kill and eat cubs.

In most cases, cubs den with their mothers for their first winter. The family group disbands the following summer, when the female again is ready to breed. A female generally raises one litter only every two years. Most females breed for the first time when 2½ years old.

Mortality factors include hunting, damage control and highway kills. Bears host ticks and internal parasites. In the wild, a rare individual might live to 25 years.

Population

In Pennsylvania, bears are found in large forested areas statewide. They are not typically found in large urban and agricultural areas. The total population currently is estimated to be 15,000.

Periodic harvesting, through hunting, helps minimize bear problems in agricultural areas — honeybee, livestock, crop destruction — and, in suburban areas.

Habitat

Bears inhabit wooded country. In spring and summer, they frequent openings to feed on fresh vegetation and berries; in fall, they occupy dense, regenerating clearcuts and mountain laurel thickets. In the northeast — a pocket of prime bruin habitat — bears favor brushy swamps with rhododendron, blueberry and spruce. They also inhabit mixed hardwood forests, especially where underbrush is thick.

Bears range over large areas. Movement is affected by food availability, breeding activities and human disturbances. Although bears show remarkable adaptability in living close to humans, their numbers decline as their habitat shrinks. Protecting suitable wild lands, especially those containing wetlands, is probably the single best habitat management tool.



Wildlife Notes are available from the
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Bureau of Information and Education
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Harrisburg, PA 17110-9797
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Wildlife Note — 14
LDR0103

Beaver

by Chuck Fergus

The beaver, *Castor canadensis*, is North America's largest rodent. Before European colonists arrived, the species was plentiful from the Mexican border to the Arctic. Beaver fur is thick and considered valuable; untanned pelts brought four dollars each in the early 1800s, when the skins were used to make top hats and to trim clothes. Tremendous demand for beaver fur sent trapping expeditions throughout the unexplored West, stimulating expansion of the new American nation.

By the end of the nineteenth century, uncontrolled trapping had eliminated beavers in Pennsylvania and other states, but today this aquatic furbearer is back. Aided by modern wildlife management and its own prolific breeding potential, the beaver has repopulated a great deal of its former range.

Today, beavers are found throughout Pennsylvania. The highest concentrations are found in the northern counties, often in remote territory and always in areas with plentiful, constant water sources. Using branches, mud and rocks, beavers build dams and lodges on streams and creeks, and along the edges of lakes and rivers. Beavers are shy and mainly nocturnal, but people interested in catching a glimpse of a beaver may get lucky by staking out a beaver pond in the early morning and near sundown.

Biology

Adult beavers weigh 40-60 pounds and grow up to 40 inches in length. (An extinct giant beaver of the Pleistocene era was the size of a bear.) They have blunt heads, short necks and legs, and stocky bodies. The coat is glossy tan to dark brown above, paler below; it consists of dense underfur covered with longer guard hairs. The thick pelt and deposits of body fat insulate the animal and allow it to remain in the water many hours at a time.

A beaver's tail is trowel-shaped, 8-12 inches long and five or six inches wide. It has a scaly, leathery covering. When the animal swims, it uses its tail as a propeller and

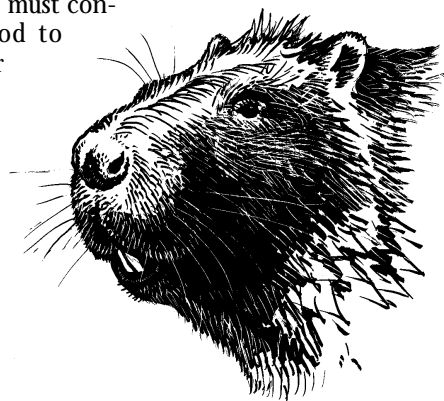
a rudder; the tail also supports a beaver when it sits erect or gnaws a tree on dry land. A sharp slap of the tail on water is a signal warning other beavers of danger.

A beaver's front feet are remarkably dextrous. They have long claws and are used for digging, handling food and working on dams. The thumb is small and weak, but the little finger is strong and has taken over the thumb's role. The hind feet, broad and webbed between the toes, propel the animal through the water. The second claw from the outside on each hind foot is double (or split) and is used for grooming.

A beaver's vision is weak, but its hearing and sense of smell are acute. Most food is located by smell. Beavers are slow on dry land but quite mobile in the water. A beaver can stay submerged up to 15 minutes; membrane valves seal the ears and nostrils while it's submerged.

Both males and females possess musk sacs, or castors, which produce an oily, heavily-scented substance called "castoreum," which the animals use to mark territories. Commercially, castoreum has been used as an ingredient for some medicines and perfumes, not to mention trapping lures. Beavers have two other sacs, one on each side of the urogenital opening, which secrete an oil. The animal rubs this oil into its fur to repel water.

Because its front teeth never stop growing, a beaver must continually cut wood to offset incisor growth. The upper and lower incisors are the primary cutters. A beaver can close its lips behind its incisors to gnaw on and transport saplings while underwater.



Beavers eat vegetable matter. They prefer soft plant foods, including grasses, ferns, mushrooms, duckweed, algae, and the leaves, stems and roots of water plants such as cattails and water lilies. When soft foods are available, beavers cut down few trees unless they're needed for dam or lodge repair.

They also eat the bark, twigs and buds of aspen, maple, willow, birch, black alder and black cherry trees. In autumn, beavers cut branches, twigs and small logs, carry them to the bottom of their home ponds, and anchor them in the mud. Then, when the pond freezes over in the winter, they still have access to food. They may also remove some sticks from the dam to lower the water and create air space under the ice.

Beavers fell trees to get at the higher, newer, more succulent growth. After eating, the beavers gnaw the trees into pieces which are then used in building dams or lodges. Small trees are eaten more completely than larger, woodier ones.

Beavers usually cut trees within 200 feet of the water's edge; apparently they feel safest within this zone, and the trees don't need to be dragged far. Beavers cannot cut trees and make them fall in a certain direction. They sometimes dig canals (1-4 feet wide and up to two feet deep) from the pond inland to float logs back to the dam.

Beavers build dams on streams and creeks. This building behavior appears to be instinctive rather than learned. Dams are made of wood cuttings packed together with mud and rocks; while a dam may hold back a sizeable pond, it also allows most of the stream flow to seep through. A dam backs up a barrier of water around the beaver's home lodge, much like a moat around a castle.

Dams require periodic maintenance, especially after heavy rains and during snow melt. Beavers may heighten the dam to raise the water level so they can reach more food without having to leave the water; or they may build additional dams upstream for the same reason.

For shelter and rearing young, beavers construct lodges. These are dome-shaped islands of sticks and logs plastered with mud. A lodge's interior compartment (the den) may be up to five feet high, with a small air hole at the top. The mud freezes in winter, making the lodge

impregnable to predators that might visit. Along fast, turbulent streams — or creeks and rivers too wide to dam — beavers either burrow deep into the bank or build lodges at the water's edge. The entrance to a lodge (whether it's on the bank or in the middle of a pond) is always below water level, while the den is dry and above water.

Beavers are generally congenial, although rivals fight during the February-March breeding season. Females are believed to be monogamous, while some authorities think males may breed more than one female. A female usually drives her family out of the lodge when she nears the end of the 12-week gestation period. In April or May, she bears 3-6 (usually 4 or 5) young called "kits." Newborns weigh about a pound; their eyes are open, their teeth erupted, and they are fully furred. If an emergency arose, they could swim, but usually they nurse 5-7 weeks before venturing from the nest.

Young remain with their parents up to two years, when they mature sexually. Then they leave on their own, or the adults drive them off. Two-year-olds usually travel downstream to look for their own territories, although occasionally they strike out across dry land. Beavers have been found miles from water.

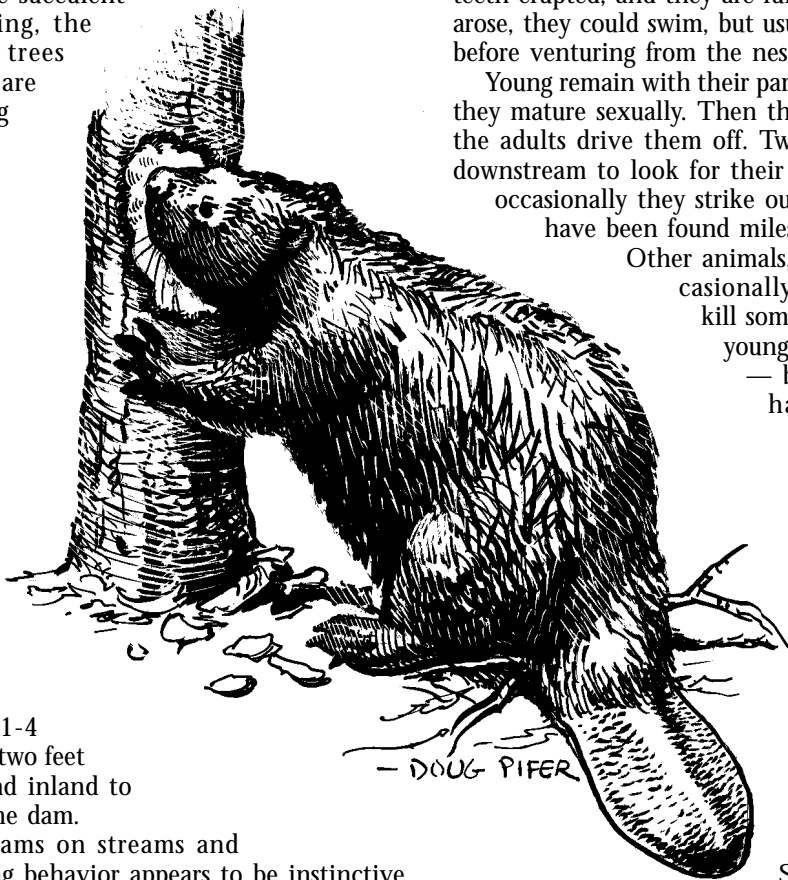
Other animals, particularly dogs but occasionally bobcats and bears, may kill some individuals — especially young ones away from the water — but on the whole, beavers have little to fear from predators. Some are struck by cars, and a few die when hit by trees they felled. Beavers live up to 15 years in captivity; the estimated lifespan in the wild is 10-12 years.

Population

By the beginning of the twentieth century, there were few if any beavers in the Keystone State. In 1903, the state

legislature passed a law protecting the species; in 1917, the Game Commission released a pair of Wisconsin beavers in a remote Cameron County valley. Over the next decade, the pair and its offspring reproduced and prospered. Beavers from this original stock — supplemented with animals bought from Canadian agencies — were live-trapped and released on refuges throughout the state. By 1934, the population was large and stable enough to allow a trapping season. That year more than 6,000 were harvested. Today, beavers are found throughout Pennsylvania in suitable habitat.

We have had mild winters and good trapping conditions since the winter of 1995-96. Over the past six seasons, we've harvested an average of 9,811 beavers per year. During the prior six years, we had an average of 5,244 beavers harvested per year — nearly half the re-



cent harvests.

Beavers can and do become troublesome for some people. Water backed up by their dams floods pastures, crop fields and roads, disrupts public water supplies and kills trees. They also cut down valuable shade trees and excavate unwanted channels. Trapping has proven to be an acceptable and economical method of controlling their numbers.

Habitat

Beavers prefer streams and creeks narrow enough to be dammed. They also live along rivers, on timbered marshland and around forest-edged lakes. They prefer remote areas, but will live near man if other sites aren't available.

Beavers prosper in maple, aspen and willow environments. Studies have indicated that each year an adult beaver cuts up to 300 trees (most having diameters less than three inches); and that under average conditions, one acre of aspen supports a five- or six-member colony for 1 to 2½ years.

The dam building of beavers affects many other wildlife species. After a dam is built, a portion of a wooded valley is changed to an open pond. Water covers the bases

of trees; this prevents oxygen from reaching the roots and kills the trees within a few years. These "snags" provide homes for many cavity-nesting birds. Ponds vary in size from a few to many acres. They provide habitat for ducks, geese, shorebirds, fish, reptiles and amphibians. Otters, raccoons, mink, herons, ospreys, hawks, owls and other predators are attracted by the rich variety of life and food.

After the beavers exhaust the supply of winter food in the area — this may take 10 or more years — they move on. Their dam usually lasts several years longer, accumulating silt, leaves and other organic material. Finally during the spring thaw, or after a long, hard rain, the dam gives way. Most of the pond water drains off, leaving an open area. Grass grows in the rich soil; later, berry bushes and shrubs. Insects and small rodents thrive in the new habitat. Deer, bear, grouse, turkeys, songbirds and insectivorous birds come to these beaver meadows, which provide edge



and openings in the forest.

The stream continues to flow through the meadow, amid many standing dead trees. Aspens and willows send up shoots. In time, another beaver colony may find this valley to be good habitat.

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Wildlife Notes

Allegheny Woodrat	Northern Cardinal, Grosbeaks, Indigo Bunting
Bats	and Dickcissel
Beaver	Opossum
Black Bear	Otter
Blackbirds, Orioles, Cowbird and Starling	Owls
Blue Jay	Porcupine
Bobcat	Puddle Ducks
Bobwhite Quail	Raccoon
Canada Goose	Rails, Moorhen and Coot
Chickadees, Nuthatches, Titmouse and Brown	Raptors
Creeper	Ring-necked Pheasant
Chimney Swift, Purple Martin and Swallows	Ruby-throated Hummingbird
Chipmunk	Ruffed Grouse
Common Nighthawk and Whip-Poor-Will	Shrews
Cottontail Rabbit	Snowshoe Hare
Coyote	Sparrows and Towhee
Crows and Ravens	Squirrels
Diving Ducks	Striped Skunk
Doves	Tanagers
Eagles and Ospreys	Thrushes
Elk	Vireos
Finches and House Sparrow	Vultures
Fisher	Weasels
Flycatchers	White-tailed Deer
Foxes (Red & Gray)	Wild Turkey
Gray Catbird, Northern Mockingbird and	Woodchuck
Brown Thrasher	Woodcock
Hérons	Wood Duck
Kingfisher	Woodpecker
Mallard	Wood Warblers
Mice and Voles	Wrens
Minks & Muskrats	



Wildlife Note — 44
LDR0103

Blackbirds, Orioles, Cowbird and Starling

by Chuck Fergus

Except for the European starling, the birds described in this Wildlife Note belong to Subfamily Icterinae, the blackbirds, a group found only in the Americas. (The introduced starling is covered here because starlings often join feeding flocks containing several kinds of blackbirds.) In the Northeast, blackbirds live mainly in open areas such as marshes, fields and woods edges. Some blackbirds are drab, while others are brightly colored. Most species are social, living in flocks outside of the nesting season.

Blackbirds eat mainly insects in summer and seeds in winter. Orioles prefer berries to seeds; grackles eat a range of foods including the eggs and nestlings of other birds. Many blackbirds employ a feeding technique called "marina." This is when an individual sticks its bill into a crevice or vegetation or beneath a rock or a stick, then suddenly opens its mandibles to push aside or pry away a screening object to expose an insect, spider, seed or some other edible item. Blackbirds exhibit a range of nesting habits: Some species build their nests on the ground,

while others build them in marsh vegetation or trees, and the

brown-headed cowbird does not build a nest at all, but lays its eggs in other birds' nests.

Bobolink (*Dolichonyx oryzivorus*) — Bobolinks breed across southern Canada and the northern United States.

Males are black, with white on the back and yellow on

the nape of the neck; females look like large sparrows. Bobolinks feed on beetles, grasshoppers, caterpillars, ants and other insects, millipedes, spiders, seeds of weeds and grasses, and grain. They nest on the ground in moist meadows and fields of hay, clover, alfalfa or weeds. The adults land away from the hidden nest and walk to it. Most clutches contain five or six eggs. In Pennsylvania bobolinks nest most successfully in the northwest and northeast on farmland at high elevations where cool spring and early-summer temperatures retard hay growth and delay cutting until after broods have fledged. Bobolinks start their southward migration in August and September; en route, flocks may damage Southern rice fields. Most cross the Caribbean and winter in South America.

Red-Winged Blackbird (*Agelaius phoeniceus*) — Many ornithologists believe the red-winged blackbird is the most populous bird species in North America. Redwings breed across the continent and as far south as Costa Rica and the Caribbean Islands. Adults are seven to nine inches long. The jet black male has on each shoulder a vivid red patch, or epaulet, bordered below by a stripe of yellow; females and juveniles lack the epaulets and are drab brown with darker streaks. The male's song is a bubbling *ook-a-lee*, and both sexes sound a harsh *check* as an alarm note.

Redwings arrive on the breeding grounds in late February and early March, with males preceding females by a week or two. They inhabit cattail marshes, swamps, wet meadows, pastures and hayfields; individuals may temporarily leave their home territories to feed in nearby fields. In summer, redwings eat dragonflies, mayflies, caddisflies, midges, mosquitoes, caterpillars, beetles, grasshoppers, cicadas and many other insects. In fall and winter they turn to seeds, which make up about three-quarters of the annual diet. They consume seeds of grasses and weeds, and grains dropped by farm machinery. Flocks of red-winged blackbirds may damage corn, wheat, oats, barley, rice and sunflower crops.

Adults usually breed within 30 miles of where they were hatched. In spring the males perch prominently, displaying their epaulets and calling to attract females and intimidate other males. (When venturing across or



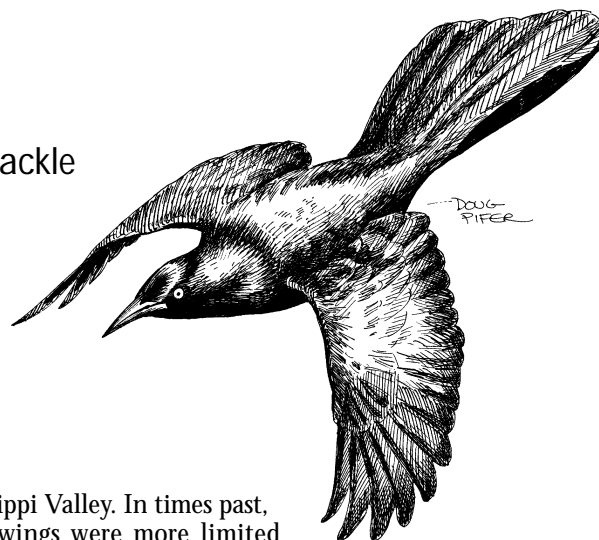
Red-Winged Blackbird

Common Grackle

into other territories to feed, males hide their epaulets by covering the red with adjoining black feathers, making it less likely that they'll be attacked by resident males.) Each male guards a breeding territory of $\frac{1}{8}$ to $\frac{1}{4}$ of an acre; within this area, one to several females will nest. A male may mate with several females, and a female may mate with more than one male. Females first breed when they're one year old. Yearling males do not often breed, although they continually try to take over older males' territories; sometimes yearlings displace reigning males, but more often they fail and must wander about during summer or until a territory opens up after its owner is killed.

Redwings nest in loose colonies. They aggressively attack crows and hawks to drive them out of the area. Males do not help with nest building. Females attach their open-cup nests to cattail stalks or other marsh vegetation or place them in low trees near or over the water; in hayfields and upland sites, females hide their nests in grass, weeds or shrubs. A female lays three or four pale bluish eggs, blotched with browns and purples. Incubation takes 10 days to two weeks. Both parents feed insects to the hatchlings, and the young leave the nest after about two weeks. In the Northeast, most redwing females raise one brood per year, renesting if a predator destroys an early clutch. Nest predators include crows, marsh wrens, raccoons and minks.

In winter, red-winged blackbirds often feed alongside grackles, cowbirds, starlings and robins. Redwings usually fly between food sources in long, strung-out flocks. At night they roost communally, males grouped separately from females. Most redwings winter in the southeastern United States, with huge concentrations in the lower Mis-

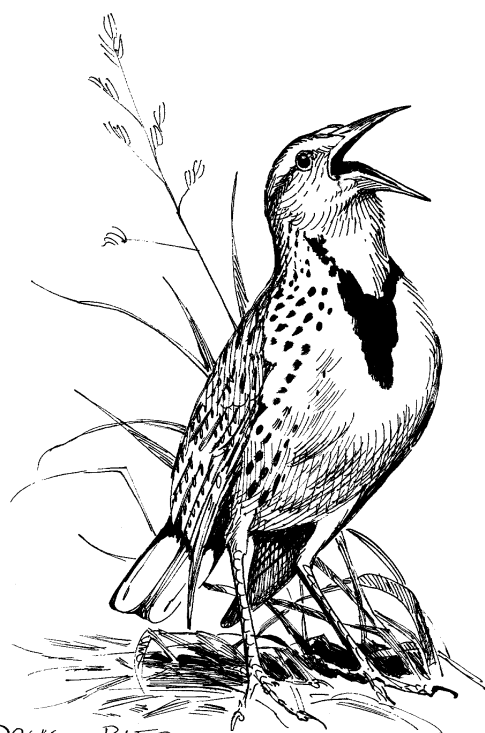


issippi Valley. In times past, redwings were more limited to wetland areas; the population increased after the species began branching out and nesting in agricultural areas. About 40 percent of adult redwings perish each year. The average life span is two to four years.

Eastern Meadowlark (*Sturnella magna*) — Both males and females have a brown-streaked back and a bright yellow breast with a prominent black V; the outer tailfeathers are white. Meadowlarks live in pastures, hayfields, fallow fields, and stripmines that have been replanted to grass. In summer they eat grasshoppers, crickets, beetles, ants, caterpillars and many other insects; they also eat seeds and waste grains. Males arrive in the spring two to four weeks before the females and stake out territories, which average seven acres. The males perch on phone poles, trees and fenceposts, singing their sweet, slurred, whistling song. Sixty to 80 percent of males have two or three mates. The female builds a ground nest in grass or weeds 10 to 20 inches high; the nest, usually in a slight depression, is made of dry grasses with a woven dome-shaped roof and a side entry.

Females lay eggs from late May through June. Early mowing of hayfields destroys many nests. The three to five eggs are white, heavily blotched with brown. The female incubates her clutch for about two weeks. After the young hatch, both parents feed them insects. Fledglings leave the nest after 10 to 12 days and are fed by their parents for another two to four weeks. Some females raise two broods over the summer. In August, meadowlarks abandon their breeding territories and forage in small flocks. In September and October most shift southward, migrating at night and feeding during the day. Some meadowlarks winter in eastern and western Pennsylvania, although most go farther south. The population has declined in the Northeast over the past 40 years as development has wiped out agricultural land and formerly farmed areas have grown up into brush and woods.

Common Grackle (*Quiscalus quiscula*) — Grackles are sleek black birds with iridescent purple, green and bronze highlights in their plumage. Adults are about one foot in length and have long wedge-shape tails. Grackles live in suburbs, towns, farming areas and streamside groves. They



Eastern Meadowlark

Brown-Headed Cowbird

forage mainly on the ground and eat insects (beetles, grubs, grasshoppers, caterpillars and many others), millipedes, spiders, earthworms, crayfish, minnows, frogs, the eggs and young of other birds, and even small rodents. In spring, males display in front of females by raising their bills, fluffing out their feathers, spreading their tails, and singing a loud, ascending reedeleeek.

Unlike most other songbirds, grackles remain social throughout the year. Most nest in colonies of 10 to 30 pairs, usually in evergreen trees, where mated pairs defend only a small area right around their nest. Grackles nest from April into July. The female builds a cup-shape nest out of grasses and mud. The typical clutch has four or five eggs. Only the female incubates, and the eggs hatch after 12 to 14 days. Both parents feed the young, which fledge after 16 to 20 days. In the fall, grackles roost in large flocks, along with starlings, red-winged blackbirds and cowbirds. Most grackles winter to the south of us, but some stay on here.

Brown-Headed Cowbird (*Molothrus ater*) — The brown-headed cowbird is a bird of farms, fields and woods edges. Males have black bodies and brown heads; females are brownish gray. Seeds of grasses and weeds, plus waste grains, make up about half of the birds' diet in summer and more than 90 percent in winter. Cowbirds also eat insects, particularly grasshoppers, beetles and caterpillars. In the past, cowbirds followed bison herds on the Great Plains, where they were known as "buffalo birds."

In spring, the male cowbird displays for females by fluffing up his body feathers, spreading his wings and tail, and singing a bubbly *glug-glug-glee*. The species builds no nest. The cowbird is a brood parasite: The female lays eggs in the nests of other birds who, guided by their instincts, raise



the young cowbirds as their own. Ornithologists believe that cowbirds did not live in forested Pennsylvania before European settlement, a theory bolstered by the fact that few of our native songbirds have evolved defense behaviors against its parasitism. Today, cowbirds are common breeders statewide, mainly in farmland and in areas where development has fragmented the forest, giving them access to the nests of woodland birds. Cowbirds have been reported to parasitize more than 220 different species. In the Northeast, cowbirds particularly plague warblers, vireos, flycatchers, finches, thrushes and sparrows.

A female cowbird will sneak in to a nest that is temporarily unoccupied, quickly lay an egg, and fly off, sometimes after removing or eating one of the host's eggs. Cowbird eggs are whitish, with brown and gray spots. Young cowbirds, hatched and fed by the host parents, grow rapidly; they monopolize food and may even crowd the other young out of the nest. Juvenile cowbirds fledge 10 to 12 days after hatching. In one study, a successfully raised cowbird caused a reduction in the brood of a host pair by only one fledgling. Other ornithologists cite cowbird predation as a major factor — along with habitat loss — in declines of many species, including the wood thrush. A female cowbird may lay up to 40 eggs in one season; of these, two or three will yield young that ultimately mature to adulthood. Cowbirds migrate in large flocks in spring and fall. They winter mainly in the southern states and in Central America. Often they share huge winter roosts with starlings and other blackbirds.



Orchard Oriole (*Icterus spurius*) — The adult male is chestnut and black, and the female is olive and yellow. This robin-size oriole inhabits open areas, including parks, old orchards, and shade groves, with scattered large trees; it avoids deep woods. In Pennsylvania, the species breeds most commonly across the southern part of the state. Orchard orioles feed on insects, berries, nectar and flowers. Pairs are thought to be monogamous. The female builds a hanging basketlike nest among dense leaves in a tree, usually 10 to 20 feet above ground. The 3 to 7 eggs are incubated for 12 to 15 days. Both parents feed the young, which leave

Baltimore Oriole

the nest about two weeks after hatching. Brown-headed cowbirds often parasitize orchard oriole nests. Long-distance migrants, orchard orioles winter in Mexico and Central America.

Baltimore Oriole (*Icterus galbula*) — Also called the northern oriole, the male of this species has a brilliant orange body and a black head (black and orange were the heraldic colors of Lord Baltimore, an English colonist and founder of present-day Maryland). The female is yellow-orange. Baltimore orioles breed throughout eastern North America in open woods, residential areas, parks, fencerows and tall trees along streams (often sycamores or willows; formerly elms were a favorite before disease killed most American elms). Adults feed on insects, particularly caterpillars; spiders; snails; berries, including mulberries, serviceberries, and blackberries; cultivated fruits; and flowers. Baltimore orioles visit feeding stations for sugar water and pieces of fruit.

The species is best known for its sacklike hanging nest, intricately woven by the female out of plant fibers, pieces of string, grapevine bark and grasses. A central chamber is lined with hair, fine grasses and cottony plant matter. Nests are usually hung at the ends of pliant branches, probably to deter predators, including snakes, blue jays and crows. Females lay three to six eggs that hatch after 12 to 14 days. Both parents feed the nestlings, which leave the nest after two weeks. Flocks depart from the breeding range quite early, in July and August. The species winters in southern Mexico, Central America and northern South America, where the birds feed on insects and nectar.

European Starling (*Sturnus vulgaris*) — From 100 birds released in the 1890s in New York City's Central Park have descended more than 200 million starlings populating North America today. Starlings are chunky birds with short tails and long straight bills; airborne, they show a distinctly triangular shape. The plumage is black with iridescent highlights. Starlings are adaptable, hardy and wary. They inhabit farmland, suburbs, cities and woods edges, and are least numerous in or are absent from marshes and extensive forests. Starlings eat almost equal amounts of animal and plant food, including beetles, grasshoppers, ants, flies, caterpillars (gypsy moth and tent caterpillars are frequent prey), earthworms, grains, cherries and mulberries. When foraging on lawns in winter, starlings are usually gaping, probing their bills into the soil and prying apart grass roots to uncover beetle larvae.

Starlings begin defending nest cavities in late winter, pre-empting them before native cavity-nesters start claiming territories. Starlings nest in woodpecker holes, crev-



European
Starling

ices in trees and buildings, and bird houses. In April, males perch outside the cavities; when they see other starlings, they sing and windmill their wings to attract a mate. The male's song includes shrill squeals, squawks and imitations of other birds' songs. The female fills the nest cavity with grasses, weed stems, twigs, old cloth and dry leaves, then lines a central cup with fine grasses and feathers. She lays four to six eggs, which are an unmarked pale bluish green. Both parents incubate the eggs, and they hatch after about 12 days. The nestlings are fed by both parents and leave the nest three weeks after hatching. By now their droppings have so fouled the cavity that the adults go in search of another nest hole in which to rear a second brood. Often they drive native birds from their nests, including woodpeckers, nuthatches, great crested flycatchers, tree swallows, house wrens and bluebirds. Harassment by starlings may have caused recent declines in populations of the northern flicker and red-headed woodpecker.

Starlings feed in flocks and roost together at night. In late summer and fall, their roosts may contain thousands of birds. Some individuals shift southward for the winter, while others remain in the Northeast; many roost in cities, where buildings give off heat, and then fly out into the surrounding agricultural land to feed during the day. Of the starlings that are alive in January, about half die in the coming year, with one third of the deaths happening in January and February. The average adult's life span is one and a half years.

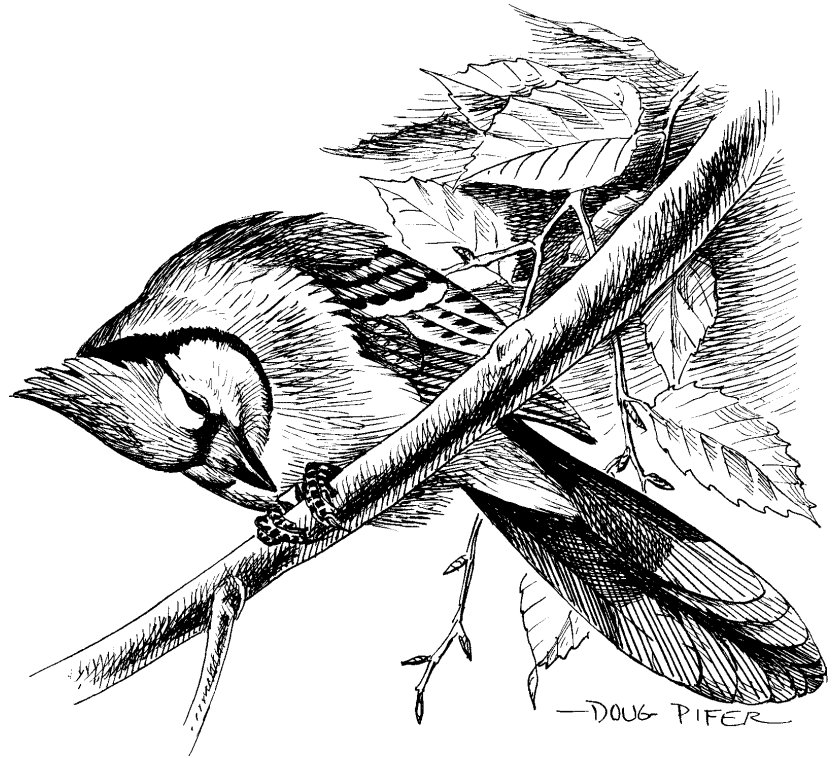
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Wildlife Note — 59
LDR0103

Blue Jay

by Chuck Fergus



The blue jay (*Cyanocitta cristata*) belongs to Family Corvidae, the Corvids, which also includes crows, ravens, and magpies in North America, and jackdaws, choughs and rooks in the Old World. Because Corvids have the largest cerebrums, relative to body size, of all birds, scientists believe them to be the smartest. Corvids are social birds, with many species living in flocks when not nesting. The bold, colorful blue jay breeds from southern Canada south to Florida and west to the Rocky Mountains.

Biology

The blue jay is 11 to 12 inches in length (larger than a robin) and has a blue back marked with black and white; its underparts are off-white, and it has a prominent blue crest on its head. The sturdy beak is straight and sharp, well suited for a variety of tasks including hammering, probing, seizing and carrying.

Blue jays live in wooded and partly wooded areas, including extensive forests, farm woodlots, suburbs and towns. About three-quarters of their diet is vegetable matter: acorns, beechnuts, various seeds (including sunflower seeds from feeding stations), corn, grain, fruits and berries. The remaining 25 percent includes insects: ants, caterpillars, beetles, grasshoppers and others, along with spiders, snails, frogs, small rodents, carrion and eggs and nestlings of other birds.

In the spring, blue jays eat caterpillars of the gypsy moth and the tent moth, major forest pests. In autumn, jays cache many acorns under the leaf duff in forest clearings and meadows. They retrieve some of the nuts in win-

ter; ones they don't retrieve help forests to regenerate, particularly on cut-over and burned lands. Confronted with abundant nuts and seeds, a jay may fill its expandable throat; later, it will disgorge the food and cache or eat it. To open an acorn, the bird grips the nut in one foot and hammers the shell apart with its bill.

Blue jays are quite vocal. They sound a raucous jay-jay to attract other jays and as an alarm call. A bell-like *toolool* is given during courtship, as is a *wheedelee* call, sometimes referred to as the "squeaky hinge" call. Blue jays often mimic the *kee-yer* calls of hawks.

Blue jays have an interesting social courtship. In early spring, from 3 to 10 males (thought to be yearling birds) shadow one female, bobbing their bodies up and down and sounding *toolool* calls. Aggressive displaying apparently scares off the competitors one by one until a single male is left as the female's mate. Ornithologists believe that older jays, ones that have bred in the past, pair up earlier and do not participate in courtship flocks. Once paired, birds move about quietly, with the female giving *kueu kueu* calls to the male when he brings her food. The female may make several preliminary or "dummy" nests, using twigs brought by the male. Later the female, with help from her mate, assembles the breeding nest, often in a dense conifer or shrub, 5 to 50 feet above the ground. The nest is seven to eight inches across, built of twigs, bark, mosses and leaves, with a 4-inch central cup lined with rootlets.

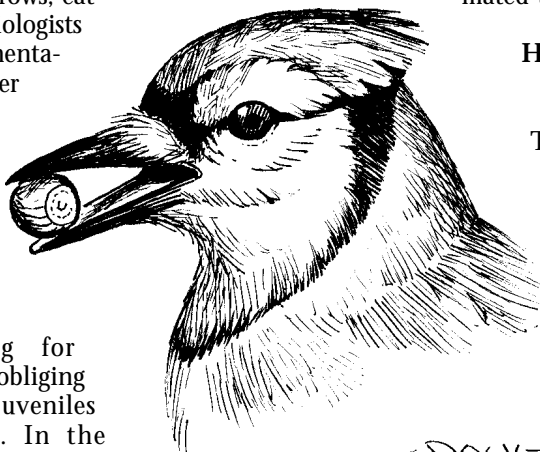
In May or June the female lays three to six eggs, pale olive or buff, spotted with brown or gray. Both sexes incubate. Blue jays are silent and furtive around the nest; one year a pair nested in a white oak next to our house,

and I hardly knew they were there once egg-laying and incubating commenced. Blue jays strongly defend their nest against intruders, calling loudly and diving at and mobbing hawks, owls, crows, squirrels and ground predators. Yet they will allow other jays to land quite near the nest. The eggs hatch after 17 to 18 days. Both parents feed the young, bringing them insects, other invertebrates and carrion. Adult blue jays often raid the nests of smaller birds, including vireos, warblers and sparrows, eating eggs and nestlings. Biologists believe that forest fragmentation is giving jays greater access to the nests of woodland birds.

The young leave the nest after 17 to 21 days. The family stays together for another month or two, with the fledglings clamoring for food and their parents obliging them, even when the juveniles are almost adult-size. In the North, blue jays raise one brood per summer; jays in the South may rear two. When the adults molt in July and August, their new plumage comes in a lustrous, beautiful blue. (In fact, the blue of the birds' plumage is not caused by pigmentation, but by structure: the feathers do not absorb the blue part of the light spectrum and, instead, cause it to scatter, giving an appearance of blue.

In late summer and early fall, family groups merge into larger foraging flocks. As the weather grows colder these groups fragment again into smaller bands. Birds from

Canada shift southward in September and October, and juveniles from the northern United States also drift to the south. In some years — perhaps when wild nuts, or mast, are scarce — blue jays move in large numbers; accipiters, particularly sharp-shinned and Cooper's hawks, accompany the flocks, picking off unwary members. Blue jays are common migrants in Pennsylvania in April and early May. The longevity record for the species is 16 years. Among adults, the annual survival rate is estimated at 55 percent.



— DOUG PIFER

Habitat

Blue jays avoid strictly coniferous forests. They thrive in areas with plentiful nut-bearing oak and beech trees. Although primarily forest birds, blue jays have adapted to living in cities, where they nest in parks and along tree-lined streets, and feed at bird feeders.

Population

The blue jay population in Pennsylvania and the Northeast is healthy. The birds nest over virtually all of the state, and were found to be among the top 10 most widely distributed species when the Pennsylvania Breeding Bird Atlas was being conducted in the late 1980s. On a continental scale, the species is expanding northwest into Canada. Biologists estimate two or three breeding pairs of blue jays per 100 acres of suitable habitat. Blue jays migrate in spring and fall, and more than 5,000 a day can be seen flying over the Lake Erie Shore during the first two weeks of May.

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Wildlife Note — 3
LDR0103

Bobcat

by Chuck Fergus

Tawny, tireless, smooth-moving and shy, bobcats are truly beautiful animals. Few persons ever actually see a bobcat; spotting one in the wild is a tremendous thrill. Despite the bobcat's elusiveness, many Pennsylvanians are intrigued by this predator.

Biology

The bobcat — also known as the bay lynx, wildcat, red lynx and swamp tiger — is our state's only feline predator. Its scientific name is *Lynx rufus*, and it is closely related to the Canada lynx, which is not found in Pennsylvania.

Bobcats are efficient, wary predators equipped with sharp senses of sight, smell and hearing. They have four large canine teeth to pierce deeply into prey; behind the canines are sharp cutting teeth. Five retractable, hooked claws on each front foot and four on the rear add to the armament.

Though it's a fierce fighter, a bobcat isn't a large animal. A mature bobcat averages 36 inches in length, including a stubby, 6-inch tail. This bobbed tail gives the bobcat its name. Pennsylvania bobcats weigh 15 to 20 pounds, with large individuals as heavy as 35 pounds.

Eight bobcat subspecies are found in the continental United States, with slightly varying pelt coloration and sizes. The bobcats in our state have gray-brown fur with dark spots and bars, which are especially noticeable on the legs. Lips, chin, the underside of the neck and the belly are white. A ruff of fur extends out and downward from the ears.

The bobcat's rangy, muscular back legs are longer than its front legs. This gives the animal a high-tailed, bobbing gait when it runs. The bobcat is a strong swimmer — although it usually jumps creeks or fords them on fallen logs — and an excellent climber.

Bobcats are mainly nocturnal, but they sometimes venture out in the daytime. They have large eyes, well-adapted to see in the dark; bobcat pupils are slit-shaped rather than round and can open wide to admit light. Two other eye adaptations that help night vision are abundant light-sensitive rods and a reflecting layer that makes an object stand out sharply from its background. Bob-

cats are colorblind and see only in shades of gray.

Small animals — mice, rats, shrews, squirrels, chipmunks, birds, rabbits and hares — form the nucleus of the bobcat's diet. But like most other predators, cats are opportunists, and porcupine, mink, muskrat, skunk, fish, frog, insect and fox remains have also been found in their stomachs.

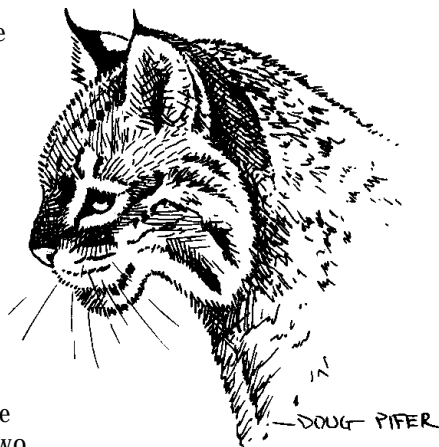
Occasionally bobcats take sick, weak or crippled deer, but predation by bobcats has little or no effect on the size of Pennsylvania's deer herd. After feeding on a deer, a bobcat may cover the rest of the carcass with leaves. Bobcats also feed on whitetails which have starved during winter or died of other causes.

Breeding takes place from late February to early March. Male bobcats don't become sexually mature until two years old. Females can breed in their first year, but often do not. During estrus, a male may travel up to 20 miles in a single night searching for a receptive female. Radio telemetry research indicates that the male leaves the female after mating and plays no part in rearing young.

Kittens are born following a 50- to 60-day gestation period. Litters range from one to four young, with about two the average. Females guard their litters carefully, as an adult male bobcat may try to kill and eat the young. Owls and perhaps foxes may take kittens. A mature bobcat has few enemies

other than man.

Bobcats give birth in dens — rock crevices, caves and hollow logs insulated with dry leaves and mosses. Though fully furred, kittens are blind and helpless at birth; their eyes open after eight or nine days and they are weaned within two



months. Kittens stay with their mothers for several more months, learning to hunt and kill prey, and reach 60 percent of their adult weight by winter.

Most wild animals are bothered by parasites, and bobcats are no exception. Fleas, mites and stomach and intestinal worms afflict bobcats. There have been few reports of rabid bobcats.

Some individuals live up to 14 years in the wild. Researchers aged captured animals by examining their teeth; each year the outer cementum layer of a bobcat's canine teeth lays down a growth ring, much like a tree does, thus making age determination possible. Bobcats in captivity usually live longer than those in the wild; one 30-pound captive male reached age 25. Research has shown a high mortality rate among bobcats during their first and second winters, before the young cats have completely mastered hunting skills.

During bad winter weather, a bobcat may shelter under overhanging rocks or in rock crevices. As soon as the storm subsides, though, the bobcat will be out hunting. If you can find its tracks in the snow, follow a bobcat on the prowl. Tracks will lead up and down mountains, cross streams (often on logs) and continue for miles. A hunting bobcat trots to a vantage point — a rock formation, steep hillside, low-leaning tree — and surveys its surroundings. Rock crevices, stumps, brush piles and thickets will be checked by a bobcat in search of a meal.

Individual bobcats have a definite territory, which is marked with feces, urine and scrape marks, and which may overlap the territories of other bobcats. Size of the territory depends on availability of food. In areas where food is abundant, the range may be as small as five miles in diameter. In the Western states, a low density of prey forces bobcats to range wider.

Habitat

In Pennsylvania, bobcats usually inhabit mountains, deep forests, swamps and, occasionally, agricultural areas.

Obviously, bobcats will live in areas where they can find ample shelter and food. Bobcats seem to prosper in remote areas near clearcuts. Studies have shown that the number of small mammals — rats, mice, shrews, etc. — increases following clearcutting (due to better food and cover conditions), and apparently cats respond to this increased prey supply. Oak leaf roller and gypsy moth caterpillars, insect pests which kill timber, may also indirectly increase small mammal populations by opening up the forest canopy and thus stimulating low, brushy growth.

A century ago, much of Pennsylvania was brushy, second-growth forest with an accompanying large population of grouse, rabbits, hares and small rodents. This terrific animal food supply and abundant uninhabited land allowed the bobcat to prosper. But when the forest matured, when saplings and sprouts grew into mature timber, when brush, thick laurel and blackberry tangles were replaced by a bare forest floor — and when man's cities and towns continued to expand — the amount of habitat suitable for bobcats shrank.

Bobcats are generally found in the state's mountain-

ous areas. They are well established in northcentral and northeastern counties. Over the past 20 years, bobcats have increased in number statewide and have been continually expanding their range.

Population

Population is in many ways a factor of habitat — poor habitat means low population. As Pennsylvania's second-growth forests matured and the number of prey animals decreased, the bobcat population fell, too. Fewer and fewer bobcats were spotted, and even tracks became hard to find. In 1970, the Game Law was changed to give the bobcat complete protection, and bobcat numbers subsequently increased.

Tough, resilient predators, bobcats are, nevertheless, affected by development of once-remote land, more and more houses, woods roads that open previously untouched areas to noise, and disturbances from ATVs and other vehicles. These intrusions, coupled with habitat change are threats to the bobcat's well-being in the more developed areas of the state.

Beginning in the 1980s, the Game Commission began various field research projects to better understand the factors affecting bobcat density and distribution throughout the state. Based on these studies and related surveys, in 2000 Pennsylvania's bobcat population was estimated to be approximately 3,500, and a hunting and trapping season, very limited, was once again offered.



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Wildlife Note — 20
LDR0103

Canada Goose

by Chuck Fergus

The lines and vees of geese come south from the tundra. The birds pass over Pennsylvania each fall, some traveling by day others winging across night skies. Their flight can be high — so high that their incessant calls do not reach earth — or low enough that the honking carries clear as church bells on a frosty morning. The lines and vees may be long and undulating, or tight, strong and symmetrical. They are following long established migratory highways to their wintering grounds — an ancient rite of autumn that will be reversed in spring.

Biology

The Canada goose (*Branta canadensis*) is a member of Order Anseriformes, Family Anatidae, a large group comprising all North American waterfowl. Waterfowl are further divided into seven subfamilies, one each for swans and geese, and five for ducks.

Canada geese belong to subfamily Anserinae. They are closely related to emperor, snow, blue, Ross's and white-fronted geese, and brants. Canada geese occur in 11 different races or subspecies, which differ in size and color. Smallest is the cackling Canada goose (weight, about 3 pounds); largest, the giant Canada goose (11 to 13 pounds). As a group, Canada geese are often referred to as "honkers."

Three distinct Canada goose subspecies occur in Pennsylvania. Two are migrants that breed in Canada; the third breeds here. The migrants comprise geese from the Southern James Bay population (*Branta canadensis interior*), which fly over westernmost Pennsylvania, and the Atlantic population (*Branta canadensis canadensis*), which migrate over eastern Pennsylvania.

Our resident geese are giant Canada geese (*Branta canadensis maxima*). Resident geese are largely non-migratory; they nest and winter here. The growth of this population has been phenomenal. Prior to 1935, no Canada geese nested anywhere in Pennsylvania. But today they can be found nesting in every county.

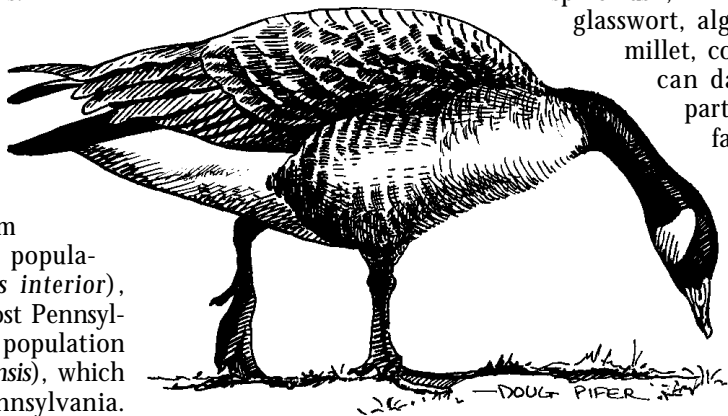
Geese are large, plump birds with long necks, short wings, a broad, round-tipped bill and short legs. Their legs are set farther forward than those of ducks or swans; this adaptation permits them to walk and graze on dry land. The feet are webbed between the three front toes. Adult males, or ganders, of the interior race average 36 inches in length and weigh approximately nine pounds. Females and immatures are a bit smaller and lighter.

Both sexes of Canada geese look alike. The bill, head, neck, legs, feet and tail are black. There is a broad white cheek-and-chin patch; the upper body is gray-brown. Flanks and underwings are a lighter gray, as are the breast and belly, which are also faintly barred. Geese have large amounts of down — fluffy feathers close to the body which create insulating dead air space — to keep them warm in cold weather.

Grazing birds, geese feed on wild and cultivated plants. They eat rhizomes, roots, shoots, stems, blades and seeds.

Foods: widgeon grass, pondweed, eelgrass, spike rush, American bulrush, cordgrass, glasswort, algae, grass, clover, wheat, millet, corn, barley and rye. They can damage cultivated crops, particularly young shoots of fall-planted wheat. Animal matter isn't a major part of their diet, although they sometimes eat insects, crustaceans and snails.

When feeding in shallow water, geese tip their bodies, dip their heads under and pull up



vegetation. On land, they feed in groups — and at least one member of the party always has its head up, looking for danger. Geese generally move in patterns to feed. Each day about dawn, they leave the water — river, pond, lake, impoundment, or whatever — fly to feeding areas, and feed for two or three hours. Then they return to the water, rest and fly out to feed again in the evening. On such forays they fly from a few hundred yards to over 20 miles, depending on availability of food.

Geese are intelligent and wary. Their vision is sharp and their hearing keen, and these senses are multiplied when the birds are in flocks. In regions where they are hunted, they quickly learn locations and boundaries of refuges where they're protected.

A honker usually runs along the surface of the water or ground to gain lift for takeoff, though when surprised can jump into flight as puddle ducks do. Once aloft, its flight may appear slow and labored — perhaps because of the bird's slow, deep wingbeats and large size — but actually it can reach 45 to 60 miles per hour. In flight, geese sound their distinctive "honking" calls; when feeding, they make a gabbling sound, and when angry, they hiss.

In spring, honkers are among the first waterfowl to breed. Unmated males fight for females; the males approach each other with necks lowered and extended, hissing loudly, pecking and flailing with their powerful wings. Individuals of both sexes usually mate for the first time in their second or third year. The pair stays together as long as both are alive and healthy; if either dies, the other usually looks for a new mate.

Geese nest in a wide variety of habitats. They like sites that afford an open view. These include islands in rivers and lakes, the tops of muskrat houses in large marshes, rocky cliffs, abandoned osprey and heron nests, artificial nesting structures and grassy fields near water. The female usually selects the site and builds the nest. Nests are typically ground depressions lined with sticks, cattails, reeds and grasses. A central cup may be lined with down, which the female plucks from her breast. Outside dimensions of nests vary from 17 to 48 inches, with 25 inches the average. Inside diameter of the central cup is 9 to 11 inches, and the nest may be 3 to 6 inches deep.

The female lays 4 to 10 eggs (usually 5 or 6). Geese nesting for the first time generally lay fewer eggs than older birds. The eggs are creamy white and unmarked at first, either smooth or with a slightly rough texture; as time passes, they become stained. Incubation averages about 28 days. The gander does not sit on the eggs but is always nearby, guarding and defending the nest and surrounding territory. To avoid detection on the nest, a goose will crouch, extend her neck, and remain still. Although

geese are gregarious from late summer through winter, nesting adults are more likely to be found by themselves.

Canada geese are highly successful in raising broods, but those nesting in northern Canada are highly susceptible to weather conditions. Late spring snow storms and cold weather can severely impact nesting and brood-raising. Flooding and predation can also cause nest failure. Raccoons, opossums and skunks destroy eggs; foxes and owls prey on goslings.

Population

The range of the Canada goose blankets the United States and most of Canada. There probably are more geese on the continent today than when the Pilgrims landed; like some other wildlife species — blackbirds, crows, woodchucks, and white-tailed deer — honkers have benefitted from increased agricultural production. Geese feed abundantly on grains and cereal crops on their migration and wintering grounds. Geese on the Atlantic Flyway now rely more on crops than on aquatic plants.

A century ago, the Canada goose population had dropped dangerously because of unrestricted market hunting on the species' wintering grounds and migration routes. Fortunately, strict law enforcement, wildlife management practices and increased farming have reversed this trend. The resulting increase in the goose population rivals the comebacks of the wild turkey and white-tailed deer.

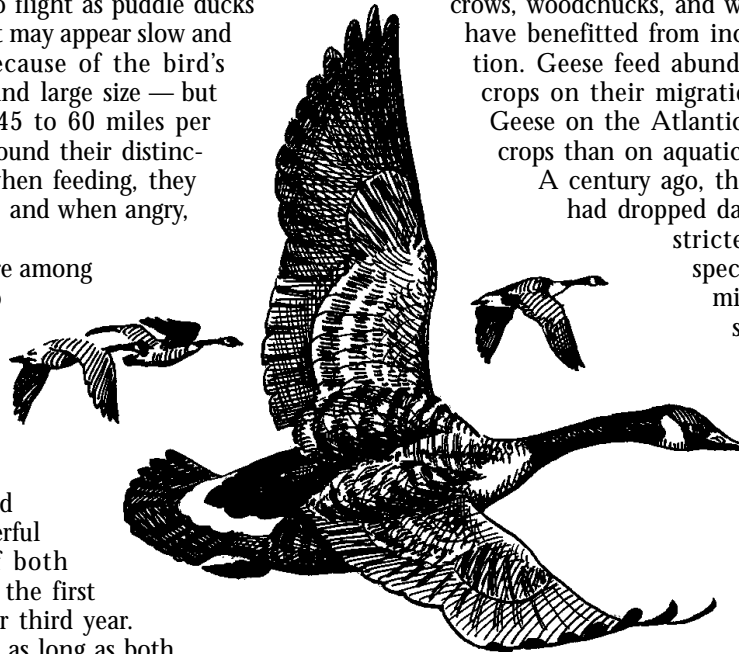
Migratory birds, geese fall under the jurisdiction of the federal government's U.S. Fish & Wildlife Service. This agency cooperatively manages all waterfowl with the states and Canadian provinces. This work includes monitoring populations and habitat, conducting research and setting annual seasons and bag limits.

Habitat

Landowners interested in attracting migrating geese can leave portions of crops unharvested. Good foods are barley, wheat, rye, grasses and corn. In feeding studies, fields of corn and small grains attracted most geese. Geese generally will not land close to fencerows, woodlots, houses or barns. Strips of corn alternating with wide grass fields often will draw flights.

Geese are quite mobile — willing and able to fly great distances to find food and resting areas. Grazing birds, they are generally more land-based than ducks, especially when goslings are growing.

Breeding habitat is tremendously variable; they do well in open fields near water, on islands, rocky cliffs, etc. Artificial nesting structures — tubs secured to trees,



old tractor tires placed on islands, or platforms built over water — may attract resident honkers. Geese raise families in city parks, reservoirs and farm ponds, although the vast majority breed in the far north.

Goslings are precocial. Their eyes are open, they are covered with a fine, brown fuzz, and they're able to walk and swim soon after they hatch. They leave the nest from several to 24 hours after hatching.

Both parents stay with the goslings, and the female broods them nightly for about a week, and then less often. When young are half-grown, their parents begin to molt. Adults lose their flight feathers and are grounded for about three weeks; during this time, the goslings are growing their own flight feathers, so parents and young are able to fly at about the same time.

As autumn approaches, geese prepare to migrate. Family groups gather in small flocks, leave the breeding grounds and fly leisurely to staging areas along the route south. Migrating geese travel by day or night, flying until tired and then landing to feed and rest.

Honkers fly in vees or occasionally in single, diagonal lines. A trailing goose encounters less air resistance, thus uses less energy, because of the turbulence set up by the bird flying just ahead.

Flight altitudes vary with weather conditions, distance to be flown and time of year. In heavy overcast, honkers may fly only a few hundred feet off the ground; under fair skies, they tower up almost a mile. An average derived from airplane pilots' reports is 2,000 feet, with 64 percent between 750 and 3,500 feet (this was for fall migra-

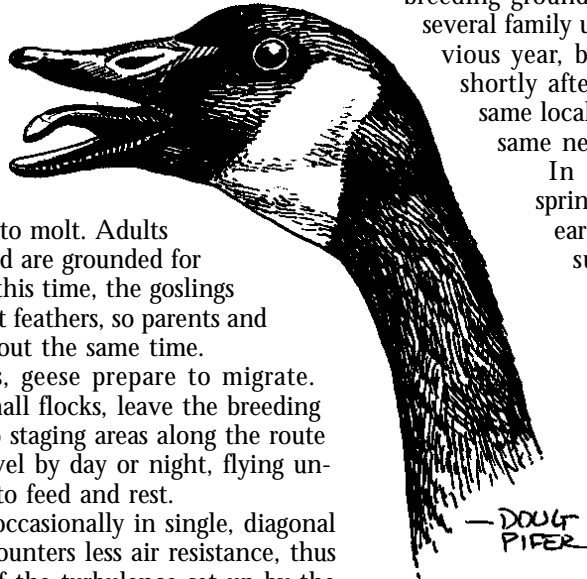
tion: during spring, altitudes average a bit lower). Geese fly high over long distances, lower for short hops.

Geese of the Atlantic Flyway winter primarily in Chesapeake Bay and Delmarva region. Smaller numbers winter from as far north as New York and coastal New England to southeastern Pennsylvania and New Jersey.

In spring, honkers retrace their routes to ancestral breeding grounds. Migrating flocks are composed of several family units, parents and offspring of the previous year, but the yearlings leave their parents shortly after arrival. Adults usually nest in the same locale year after year, some even using the same nest foundation.

In Pennsylvania, geese are common spring migrants in late February, March and early April, with stragglers into May. In summer, resident flocks breed here: strong concentrations exist in Game Commission waterfowl areas such as Pymatuning and Middle Creek, as well as other suitable habitat in the state. In fall, honkers are common September-November migrants. If the winter is mild, some stop in the southeastern portion of the state, although most go farther south.

Because they're big, strong and aggressive, geese are less subject to predation than most other waterfowl. Hawks and owls prey on immatures and some adults, and snapping turtles, snakes and land-based predators take goslings which stray from their parents' protection. Disease, parasites and accidents also take their toll, and annual mortality ranges from 32 to 52 percent. Geese have potential lifespans of 15 to 20 years.



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Wildlife Notes

Allegheny Woodrat	Northern Cardinal, Grosbeaks, Indigo Bunting
Bats	and Dickcissel
Beaver	Opossum
Black Bear	Otter
Blackbirds, Orioles, Cowbird and Starling	Owls
Blue Jay	Porcupine
Bobcat	Puddle Ducks
Bobwhite Quail	Raccoon
Canada Goose	Rails, Moorhen and Coot
Chickadees, Nuthatches, Titmouse and Brown	Raptors
Creeper	Ring-necked Pheasant
Chimney Swift, Purple Martin and Swallows	Ruby-throated Hummingbird
Chipmunk	Ruffed Grouse
Common Nighthawk and Whip-Poor-Will	Shrews
Cottontail Rabbit	Snowshoe Hare
Coyote	Sparrows and Towhee
Crows and Ravens	Squirrels
Diving Ducks	Striped Skunk
Doves	Tanagers
Eagles and Ospreys	Thrushes
Elk	Vireos
Finches and House Sparrow	Vultures
Fisher	Weasels
Flycatchers	White-tailed Deer
Foxes (Red & Gray)	Wild Turkey
Gray Catbird, Northern Mockingbird and	Woodchuck
Brown Thrasher	Woodcock
Hérons	Wood Duck
Kingfisher	Woodpecker
Mallard	Wood Warblers
Mice and Voles	Wrens
Minks & Muskrats	



Wildlife Note — 42
LDR0103

Chickadees, Nuthatches, Titmouse and Brown Creeper

by Chuck Fergus

These woodland birds are mainly year-round residents in their breeding areas. They become most apparent in fall and winter when all four types may occasionally be seen together, along with downy woodpeckers and kinglets, in mixed-species foraging flocks. In these groupings, the greater number of eyes may improve foraging efficiency and detect potential predators. Our two chickadees and the tufted titmouse belong to Family Paridae, omnivorous feeders that cache excess seeds in holes or bark crevices, remember the locations, and return later to eat the food. The two nuthatches are in Family Sittidae. They glean insect food from the trunks of trees and also eat nuts; their common name derives from the way they “hack” nuts apart using their stout pointed bills. Taxonomists place the brown creeper in Family Certhiidae, a group that includes only six species, the other five of which inhabit Europe and Asia.

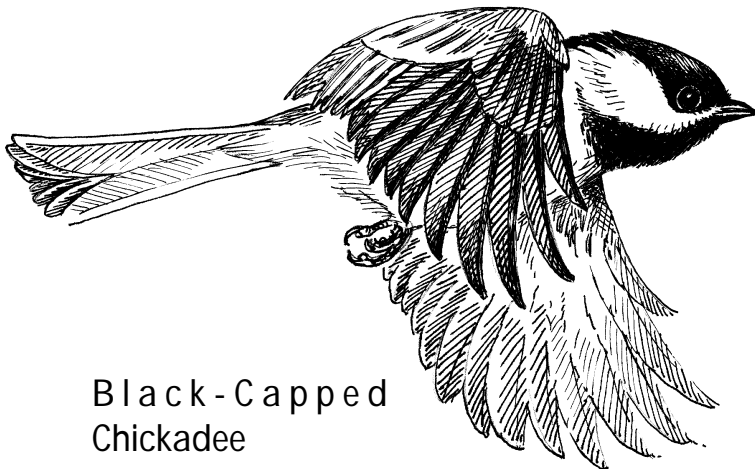
Black-Capped Chickadee (*Poecile atricapillus*) — A black cap and bib, buffy flanks, and a white belly mark this small

(five inches long), spunky bird. Chickadees have short sharp bills and strong legs that let them hop about in trees and cling to branches upside down while feeding. They fly in an undulating manner, with rapid wingbeats, rarely going farther than 50 feet at a time. The species ranges across northern North America, living in deciduous and mixed forests, forest edges, thickets, swamps, and wooded areas in cities and suburbs. Black-capped chickadees are common throughout Pennsylvania, except for the state’s southwestern and southeastern corners, where they’re replaced by the similar Carolina chickadee.

About two-thirds of a chickadee’s diet consists of animal protein: moth and butterfly caterpillars (including early growth stages of gypsy moths and tent moths), other insects and their eggs and pupae, spiders, snails and other invertebrates. In late summer and fall, chickadees eat wild berries and the seeds of ragweed, goldenrod and staghorn sumac. In the fall chickadees begin storing food in bark crevices, curled leaves, clusters of pine needles, and knotholes. The birds rely on these hoards when other food becomes scarce. Chickadees also eat suet from feeding stations and fat from dead animals.

In winter, chickadees live in flocks of six to 10 birds with one dominant pair. Listen for the *chick-a-deedee-dee* calls that flock members use to keep in contact while foraging around a territory of 20 or more acres. A flock will defend its territory against other chickadee flocks. At night chickadees roost individually in tree cavities or among dense boughs of conifers. A roosting bird tucks its head under a wing to conserve body heat. On cold nights, a chickadee’s temperature drops from a normal 108°F to about 50°F, causing the bird to enter a state of regulated hypothermia, which saves significant amounts of energy. Chickadees lose weight each night as their bodies slowly burn fat to stay alive; they must replace those fat stores by feeding during the next day.

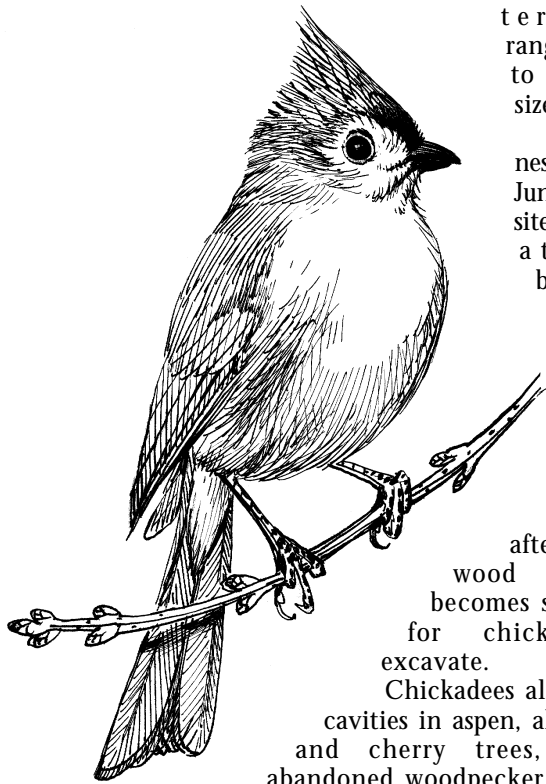
Chickadees mate for life. In spring, the



Black-Capped
Chickadee

—DOUG PIFER

Tufted Titmouse



—DOUG PIFER

winter flocks break up as pairs claim nesting territories ranging from 3 to 10 acres in size.

Chickadees nest in May and June. The usual site is a hole in a tree, dug out by both sexes. Birch is a favorite, because this tree's tough outer bark stays intact after the inner wood rots and becomes soft enough for chickadees to excavate.

Chickadees also clear out cavities in aspen, alder, willow, and cherry trees, and use abandoned woodpecker holes. The cavity is usually 4 to 10 feet above the ground. The female assembles the nest by laying down a base of moss, then adding softer material such as animal fur or plant fiber. House wrens compete for nest cavities and may destroy chickadee eggs and broods; raccoons, opossums and squirrels raid nests. Chickadees will renest if a first attempt fails. Only one brood is raised per year.

The five to nine eggs are white with reddish brown dots. The female incubates them, and the male brings her food. The eggs hatch after 12 days. Juveniles beg loudly and are fed by both parents. Young fledge about 16 days after hatching. Some three to four weeks after fledging, the young suddenly disperse, moving off in random directions. As winter approaches, they join feeding flocks. Some become "floaters," moving between three or more flocks, ready to pair with an opposite-sex bird should its mate die.

Chickadees are taken by many predators including sharp-shinned hawks, American kestrels, Eastern screech owls, saw whet owls, and domestic and feral cats. Sometimes chickadees mob these enemies while sounding zee-zee-zee alarm calls. The average life span for a chickadee is two and a half years, and the current longevity record is 12 years, nine months. Every few years long-distance movements take place within the population, "irruptions" that may be launched by failure of seed crops or high reproductive success.

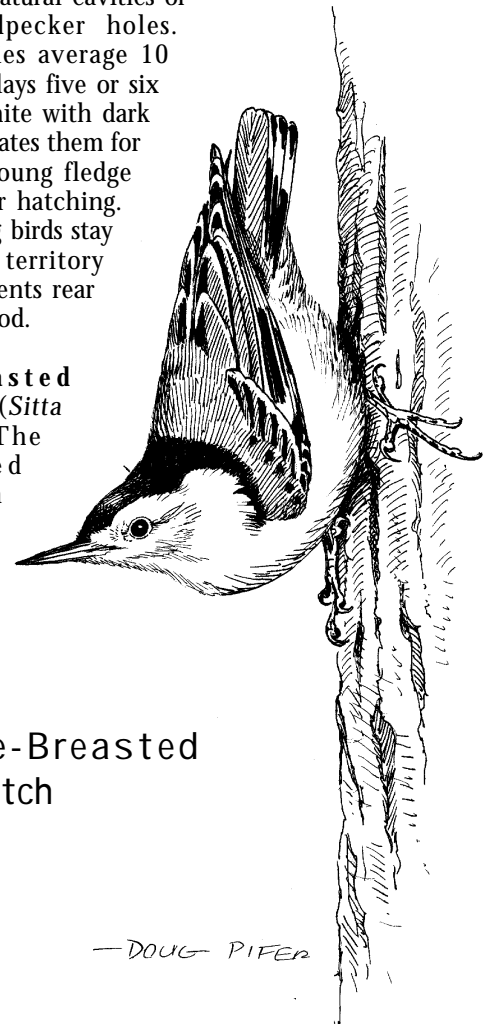
Carolina Chickadee (*Poecile carolinensis*) — Similar to the black-capped chickadee in appearance and life history, this species lives in milder climates across the southeastern United States. The Carolina chickadee breeds in southeastern and southwestern Pennsylvania.

Tufted Titmouse (*Baeolophus bicolor*) — This trim bird has gray-and-white plumage, a prominent head crest, and black "shoebutton" eyes. The species ranges through eastern North America into southern New York and New England. It has extended its range northward over the last half-century, perhaps because of climatic warming and an increase in bird feeding by humans. In the early 1900s the tufted titmouse was absent from northern Pennsylvania; today it breeds statewide.

Titmice eat insects (caterpillars, wasps, bees, sawfly larvae, beetles and many others, as well as eggs and pupae), spiders, snails, seeds, nuts and berries. Like the chickadee, the titmouse forages by hopping about in tree branches, and often hangs upside down while inspecting the underside of a limb. To open a nut or seed, the bird holds the object with its feet and pounds with its bill. Titmice cache many seeds; with sunflower seeds, the birds usually remove the shell and hide the kernel within 120 feet of the feeding station, under loose bark, in cracks or furrows in bark, on the ground, or wedged into the end of a broken branch or twig.

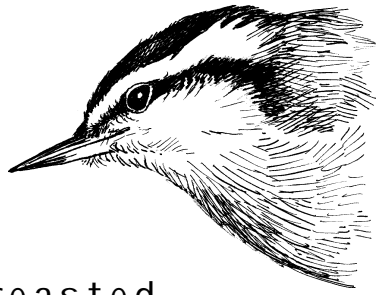
Winter flocks are often made up of parents and their young of the previous year. Titmice are early breeders: males start giving their *Peter Peter* territorial song in February. In Pennsylvania, pairs begin building nests in late March and early April. Titmice are believed not to excavate their own nest cavities; instead, they use natural cavities or abandoned woodpecker holes. Breeding territories average 10 acres. The female lays five or six eggs, which are white with dark speckles, and incubates them for two weeks. The young fledge about 18 days after hatching. Sometimes yearling birds stay on in their natal territory and help their parents rear the next year's brood.

White-Breasted Nuthatch (*Sitta carolinensis*) — The white-breasted nuthatch has a slate-gray back, a



White-Breasted Nuthatch

—DOUG PIFER



Red-Breasted Nuthatch

white breast and face, and a cap that is black in the male and ashy gray in the female. Nuthatches inhabit deciduous forests throughout Pennsylvania and the East. They climb around in trees, walking in a herky-jerky manner up and down and around the trunks, along branches and the undersides of limbs. Both sexes sound a nasal *ank ank* call. Pairs live in home territories of 20 to 35 acres.

White-breasted nuthatches feed on insects and spiders in summer and on nuts and seeds in winter. They relish suet at feeding stations and carry away sunflower seeds for caching. Sometimes they forage on the ground. Nuthatches wedge acorns and hickory nuts into tree bark and then hammer the shells off with blows from their awl-like beaks.

During courtship, the male bows to the female, spreading his tail and drooping his wings while swaying back and forth; he also feeds her morsels. Before building the nest, the birds rub or sweep crushed insects back and forth over the inside and outside of the nest cavity. Ornithologists speculate that this sweeping behavior leaves chemical secretions behind that may repel predators or nest competitors. The female builds a nest inside the cavity (commonly a rotted-out branch stub or an abandoned squirrel or woodpecker hole) using twigs, bark fibers, grasses and hair. She lays five to nine white, brown-spotted eggs and incubates them for 12 to 14 days while her mate brings her food. Both parents feed insects and spiders to the young, which fledge after two or three weeks, usually in June.

Red-Breasted Nuthatch (*Sitta canadensis*) — In Pennsylvania, this species is found mainly in the northern part of the state; it ranges through New England and across Canada. Slightly smaller than the white-breasted nuthatch, the red-breasted has a rusty tinge to its breast and a prominent black eye-stripe. The species lives in areas where evergreens are plentiful and often nests in pine plantations. Red-breasted nuthatches feed on insects and on seeds, particularly those of conifers. They nest in tree cavities 5 to 40 feet above the ground. Five or six young are

produced in a single annual brood. In some autumns, large numbers of red-breasted nuthatches show up south of their normal range; biologists believe that poor cone production in northern forests drives these movements.

Brown Creeper (*Certhia americana*) — Brown creepers are inconspicuous birds whose intricately patterned backs help blend them in with the tree bark that is their near-perpetual home. Brown creepers breed across a huge range extending from Alaska and Newfoundland south to Nicaragua. They favor mature forests with many large trees. The species is found in much of Pennsylvania, although numbers are lower in the state's southeastern and southwestern corners. Braced by their long stiff tails,

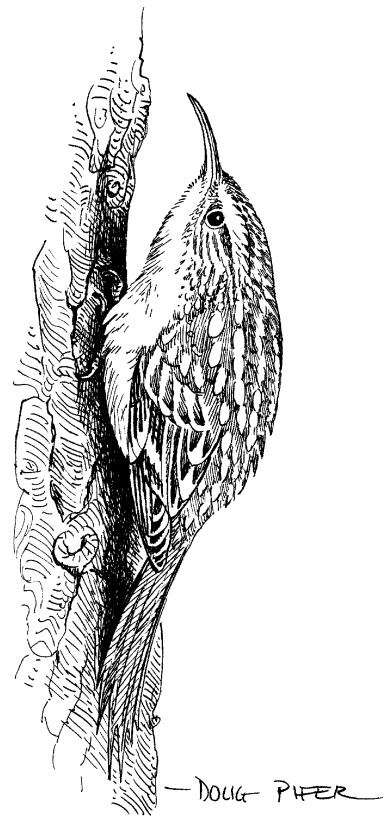
brown creepers climb slowly up tree trunks, following a spiral course. They inspect bark furrows and use their decurved bills to tease out insects, pupae and eggs. They also eat spiders and seeds.

The call is a long, thin *seeee*; the male also voices a subtle breeding song. The species nests under peeling bark, often in a shagbark hickory or a dead or dying tree, less frequently in a cavity.

A hammocklike twig nest is built to fit the available space. The female lays four to eight eggs, which are whitish and dotted with reddish brown. Incubation takes 14 to 17 days, and young leave the nest two weeks after hatching. Brown

creepers from the Northeast may migrate south to Florida and the Gulf Coast. In winter, brown creepers sometimes mix in with foraging flocks of chickadees; perhaps these are residents, or northern birds that have shifted southward.

Brown Creeper



Wildlife Notes

Allegheny Woodrat	Opossum
Bats	Otter
Beaver	Owls
Black Bear	Porcupine
Blackbirds, Orioles, Cowbird and Starling	Puddle Ducks
Blue Jay	Raccoon
Bobcat	Rails, Moorhen and Coot
Bobwhite Quail	Raptors
Canada Goose	Ring-necked Pheasant
Chickadees, Nuthatches, Titmouse and Brown Creeper	Ruby-throated Hummingbird
Chimney Swift, Purple Martin and Swallows	Ruffed Grouse
Chipmunk	Shrews
Common Nighthawk and Whip-Poor-Will	Snowshoe Hare
Cottontail Rabbit	Sparrows and Towhee
Coyote	Squirrels
Crows and Ravens	Striped Skunk
Diving Ducks	Tanagers
Doves	Thrushes
Eagles and Ospreys	Vireos
Elk	Vultures
Finches and House Sparrow	Weasels
Fisher	White-tailed Deer
Flycatchers	Wild Turkey
Foxes (Red & Gray)	Woodchuck
Gray Catbird, Northern Mockingbird and Brown Thrasher	Woodcock
Hérons	Wood Duck
Kingfisher	Woodpecker
Mallard	Wood Warblers
Mice and Voles	Wrens
Minks & Muskrats	
Northern Cardinal, Grosbeaks, Indigo Bunting and Dickcissel	

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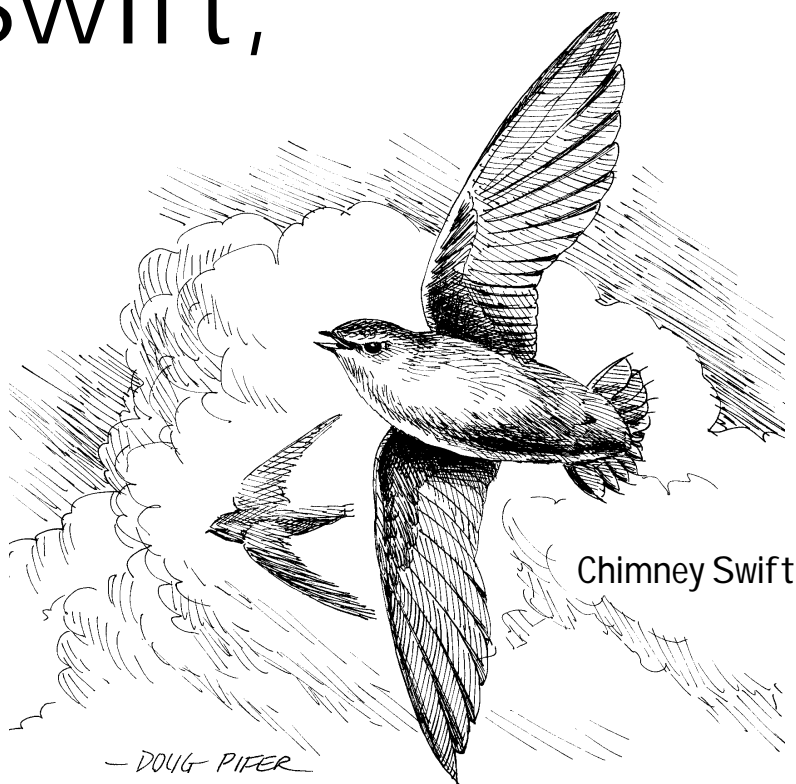
Wildlife Note — 53
LDR0103

Chimney Swift, Purple Martin and Swallows

by Chuck Fergus

Swifts, martins and swallows are built for life in the air. They have long tapering wings and lightweight bodies. Their short, wide bills open to expose gaping mouths for scooping up insect prey. The chimney swift belongs to Family Apodidae, with 90 species worldwide. The purple martin and the swallows are in Family Hirundinidae, also with about 90 species around the globe. The chimney swift has tiny, vestigial feet with four clawed toes facing forward, letting it cling to upright surfaces; the feet of the purple martin and the swallows have three toes forward and one to the rear, for perching on branches and wires.

Many of these birds are social and breed in colonies. Purple martins usually nest in artificial boxes with multiple chambers, put up by people wanting to attract these insect eaters; the other swallows build or occupy different sorts of nests, depending on their species. Most swallows do not defend territories. The males sing mainly to attract and communicate with females. Both parents usually share in incubating eggs and feeding young. Swifts, martins and swallows often forage in groups, soaring above forests, farms and urban areas. During wet weather they hunt at lower altitudes, where insects fly under damp conditions. These birds undertake long migrations. The seven species that breed in Pennsylvania winter in the Gulf states, Central America and South America.



Chimney Swift

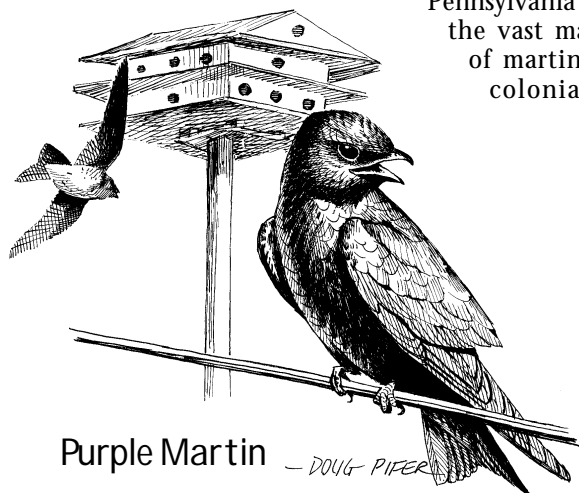
Chimney Swift (*Chaetura pelagica*) — The common name comes from the bird's favorite nesting habitat and the speed of its flight. A chimney swift is sooty gray, about five inches long, and has a one-foot wingspan; the body looks stubby between the long, narrow wings. The bird spends most of the daytime hours in the air; its flight is bat-like, with shallow wingbeats and erratic stalls and turns as the bird singles out insects or sweeps through clouds of prey. A loud clicking call is uttered in flight. Chimney swifts eat flies, leafhoppers, flying ants, mayflies, stoneflies, beetles, leaf bugs and other flying insects. They take spiders, mainly small ones floating on strands of silk borne aloft by air currents. Chimney swifts drink on the wing, skimming low over ponds, and they even gather materials for their nests while in flight, using their feet to break tips off dead branches and carry them back to the nest site.

Chimney swifts are thought to be monogamous and to mate for life. Pairs sometimes glide in tandem with their wings raised in a V. In the past, chimney swifts nested in hollow trees and caverns. Today they use manmade structures almost exclusively: factory and house chimneys, silos, air shafts and old wells, where they are protected from storms and predators. The nest is shaped like

a half-saucer and cemented to a vertical surface, the twigs held together by the adults' glutinous saliva, which solidifies and binds as it dries. Females lay three to six eggs (four or five are usual), which are white and unmarked. Both sexes participate in the 18- to 21-day incubation. The newly hatched young are altricial and are fed regurgitated insects. Sometimes a third "parent," probably a yearling offspring of the adults, helps to feed and brood nestlings. The young fledge a month after hatching and join feeding flocks. In late summer swifts gather in the evening before flying into large factory chimneys, where they roost by the thousands.

Chimney swifts are not common in the densely wooded parts of Pennsylvania, where trees may not be mature enough to offer cavities for nesting and roosting. Swifts arrive in the Northeast in May, raise a single brood in June and July, and head south in August and September. They winter mainly in the Amazon Basin. The average lifespan is four years.

Purple Martin (*Progne subis*) — At eight inches in length, the martin is the largest North American swallow. Adult males are a glistening blue-black; females and yearlings are grayish with pale bellies. Both sexes have a notched tail. Martins, less maneuverable than other swallows, glide in circles punctuated with short periods of flapping flight. Before Europeans came to the New World, native Americans were hanging gourds around their villages to attract purple martins, which also nested in caves and hollow trees. In Pennsylvania today, the vast majority of martins nest colonially in



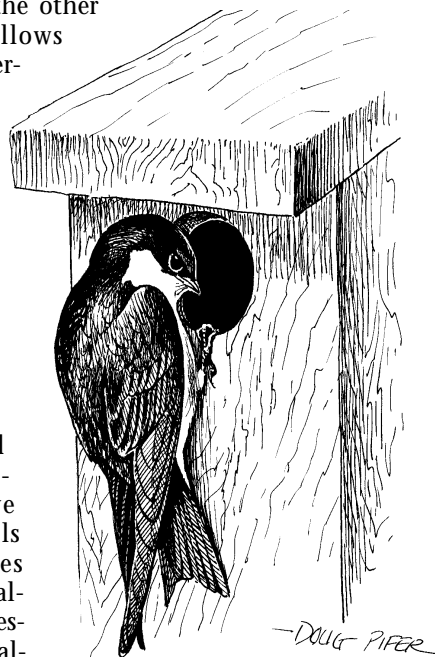
Purple Martin

compartmented boxes that people put up for them. Martins inhabit open areas near water, meadows and farmland. They feed on winged ants, wasps, bees, flies, dragonflies, beetles, moths and butterflies. Males arrive first in the spring, followed by females. The call is a throaty, gurgling *tchew-wew*. One male may mate with more than one female. The four or five eggs are white and unmarked, laid on a nest of grass, twigs and leaves inside the nest chamber. Flocks of martins gather by the thousands in August and September prior to migration. The female incubates them for 15 to 18 days. The species winters in the Amazon Basin.

Tree Swallow (*Tachycineta bicolor*) — Tree swallows nest across Canada and most of the northern United States. They are five to six inches long, an iridescent green-black or blue-black above and bright white below. They nest in tree cavities, woodpecker holes and bluebird houses put up by humans. The earliest of our swallows to return north, they arrive in late March

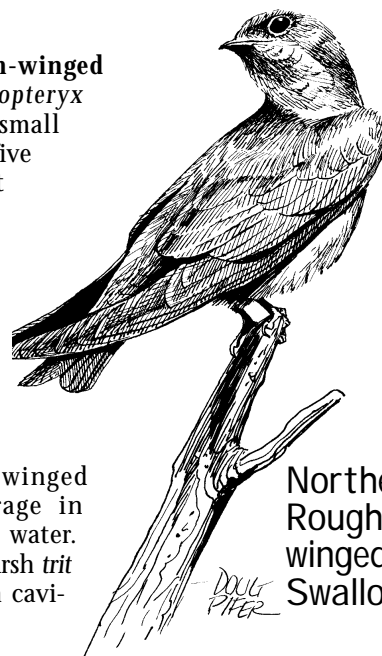
Tree Swallow

and April; unlike the other species, tree swallows switch to eating berries and seeds to survive cold periods when insects become torpid. They often breed near the still waters of lakes, ponds and marshes, competing for nest cavities with bluebirds, starlings, house sparrows and house wrens. Ornithologists believe that individuals choose new mates each year. Tree swallows are more aggressive than other swallow species and defend an area within a radius of about 15 yards from the nest.



The female lines the nest cavity with grass, weeds, rootlets and pine needles; after the four to seven pinkish-white eggs are laid, she often adds feathers (usually white ones) from other birds. Incubation takes 14 to 15 days. The young fledge three weeks after hatching. Tree swallows migrate in flocks to wintering grounds in the Gulf states and Central America.

Northern Rough-winged Swallow (*Stelgidopteryx serripennis*) — This small (body length, about five inches), nondescript brown and white swallow is named for small serrations in its outermost wing feathers. The species breeds across the United States and in Central America. Rough-winged swallows often forage in flight above moving water. The call is a short, harsh *trit bit*. The birds nest in cavi-



Northern Rough-winged Swallow

ties in rock faces, quarries and stream banks, frequently in abandoned kingfisher burrows, drainpipes and culverts; sometimes they excavate their own burrows. At the end of a one- to six-foot tunnel, the birds heap up twigs, bark, roots and weeds, and line a central cup with fine grasses. The four to eight pure white eggs hatch after about 16 days of incubation. Rough-winged swallows nest throughout Pennsylvania, rarely in colonies. They winter along the Gulf Coast and in Central America.

Bank Swallow (*Riparia riparia*) — About 5½ inches long, this small brown-backed swallow has a dark band across its pale breast. Although they have small feet and tiny bills, bank swallows usually dig their own burrows, up to five feet deep in dirt banks, piles of gravel or sand and roadcuts. Nest entries of neighboring pairs may be only a foot apart. Colonies arise and die out as banks of

suitable burrowing materials become available and then lose qualities that bank swallows require, such as steepness and height. Bank swallows forage over fields and wetlands and along rivers and ponds, taking flies, beetles, wasps, winged ants, dragonflies, stoneflies,

Bank Swallow



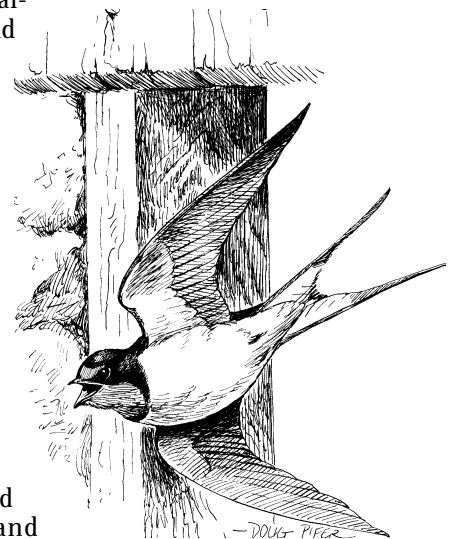
moths and other flying insects. They nest from May until July. The clutch averages four or five eggs. In late summer bank swallows may gather in large flocks before departing for wintering grounds in South America. The species also breeds in Europe and Asia, where it is known as the sand martin.

Cliff Swallow (*Hirundo pyrrhonota*) — Body length, five to six inches; a pale rusty or buff-colored rump distinguishes this species. From below, the tail looks squared-off. Cliff swallows eat flying beetles, flies, winged ants, bees, wasps, mayflies, lacewings and many other insects. They build gourd-shaped nests out of pellets of mud, attached to cliffs, bridge supports, dams and walls of unpainted barns and derelict buildings under eaves that protect against rain. A typical nest takes one to two weeks to build and requires more than 1,000 mud pellets. Colonies can be dense: in one

instance, 800 nests were clustered on the side of a barn. The adults line the inside of the nest with grass, hair and feathers. The three to six eggs are white spotted with brown. Both sexes incubate for about 15 days. A female cliff swallow will sometimes lay an egg in another swallow's nest, or carry an egg in her bill to a neighboring nest. Cliff swallows winter in southern South America. The population is thought to be increasing in North America.

Barn Swallow (*Hirundo rustica*) — The flight of these sleek, long-tailed blue-and-buff swallows can look like an aerial ballet, with the birds sideslipping, stalling, twisting and turning low over water or fields in pursuit of their prey: house flies, horse flies, beetles, wasps, bees, winged ants and others. In bad weather, barn swallows may land and eat spiders, snails, berries or seeds. Pairs nest on their own, or near a few other pairs. Barn swallows are common, abundant breeding birds in Pennsylvania and the Northeast. They build bowl-shaped nests out of mud and straw, fixing them to walls, beams and eaves of barns and other outbuildings; in culverts and under bridges; and rarely on the cliff faces and caves which were the species' original habitat before

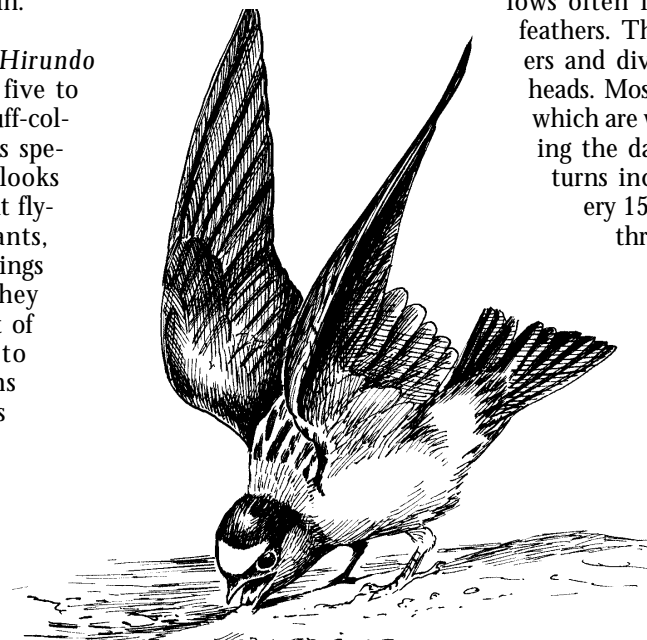
Barn Swallow



Europeans settled North America. Barn swallows often line their nests with poultry feathers. The adults scold human intruders and dive at them, zipping past their heads. Most females lay four or five eggs, which are white spotted with brown. During the day both male and female take turns incubating, switching about every 15 minutes. Young leave the nest three weeks after hatching. Some pairs raise a second brood.

Barn swallows from eastern North America winter in Panama, Puerto Rico and throughout South America. *Hirundo rustica* is the most widespread swallow species in the world, breeding in North America, Europe and Asia.

Cliff Swallow



Wildlife Notes

Allegheny Woodrat	Opossum
Bats	Otter
Beaver	Owls
Black Bear	Porcupine
Blackbirds, Orioles, Cowbird and Starling	Puddle Ducks
Blue Jay	Raccoon
Bobcat	Rails, Moorhen and Coot
Bobwhite Quail	Raptors
Canada Goose	Ring-necked Pheasant
Chickadees, Nuthatches, Titmouse and Brown Creeper	Ruby-throated Hummingbird
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Eagles and Ospreys	Vireos
Elk	Vultures
Finches and House Sparrow	Weasels
Fisher	White-tailed Deer
Flycatchers	Wild Turkey
Foxes (Red & Gray)	Woodchuck
Gray Catbird, Northern Mockingbird and Brown Thrasher	Woodcock
Herons	Wood Duck
Kingfisher	Woodpecker
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Minks & Muskrats	
Northern Cardinal, Grosbeaks, Indigo Bunting and Dickcissel	

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Wildlife Note — 55
LDR0103

Common Nighthawk and Whip-Poor-Will

By Chuck Fergus

The common nighthawk and the whip-poor-will belong to Family Caprimulgidae, a group of nocturnal and crepuscular birds also known as the nightjars; 80 species are found around the world. Nightjars have large heads and eyes and exceedingly wide mouths, used as scoops for catching insects in midair. Their long wings and large tails contribute to a buoyant, maneuverable flight. Their legs are short, and their feet are small and weak. Most spend the day resting on the ground or roosting in trees, perched lengthwise on limbs. "Nightjar" seemingly refers to the birds' nocturnal habits and the jarring or grating aspect of their vocalizing. The nightjars are also known as "goatsuckers," from an erroneous belief that the birds use their expansive maws to steal milk from goats and other livestock.

Common Nighthawk (*Chordeiles minor*) — The name "nighthawk" is a misnomer, as the bird is not related to the hawks and it flies mainly at dawn and dusk rather than at night. A nighthawk is about nine inches long, with a wingspread of almost two feet; individuals weigh from two and a half to three and a half ounces. The flight pattern is bouncy, erratic, full of twists and turns. Nighthawks spend the summer in many cities and small towns across the state. During late summer evenings many people see flocks of nighthawks flying high above towns and farmland, but few have gotten a close look at the birds. The plumage is a mix of dark gray and brown. The long wings have a crook about halfway out and then taper to a point. The tail has a white band; white brightens the chin and throat; and a white "bandage" on each wing is clearly visible from below.

Unlike whip-poor-wills, which sit in wait and then sally forth to catch individual insects, nighthawks remain on the wing for extended periods, flapping, gliding, stalling and swerving as they chase and catch prey. Their bat-like flight has earned them the nickname "bullbat." More

than 50 insect species have been reported as prey, including flying ants, June bugs, mosquitoes, moths, mayflies, caddisflies, wasps and grasshoppers. Nighthawks drink on the wing, skimming the surface of lakes and streams. They do not fly during heavy rain, strong winds or cold weather.

The call is a loud, nasal *Peent* which, according to one source, resembles the word "beard" whispered loudly. As part of his breeding display, the male also makes a booming sound, which is produced by air rushing through his primary wing feathers after a sudden downward flexing of the wings while diving. Years ago, while camping at a back-country site in the Badlands National Park in South Dakota, I sat enraptured by nighthawks "booming" above the prairie through the extended twilight of a June evening and on into moonlit night.

Chordeiles minor has a large breeding range, from the Yukon Territory to Labrador and south to Florida, Texas and Central America. The birds nest in open fields, gravel beaches, rock ledges, burned-over woods, grasslands and flat graveled roofs of buildings such as schools and grocery stores. The female nighthawk does not build a nest; she lays her two eggs directly on the ground. The laying period peaks around the first of June. Nighthawk eggs are creamy or pale gray, dotted with brown and gray. The female does most of the incubating (the male may spell her at times), and the eggs hatch after about 18 days. Nestlings are "semi-precocial": their eyes are open and they are able to move from side to side after hatching. Females may feign injury to draw predators away from the nest. Both parents feed the chicks by regurgitating insects to them. At around 18 days, young nighthawks make their first flights. They can fly capably by 30 days, and by 50 days they are fully developed. Nighthawks raise only one brood per year. They are among the earliest breeding birds to leave Pennsylvania, commencing their southward migration in August.



Nighthawk

The average life span of a common nighthawk is estimated at four to five years; banded birds as old as nine years have been recovered. Since the 1960s the number of breeding and migrating nighthawks has fallen noticeably. This decline may stem from indiscriminate use of pesticides, increased predation, or changes in habitat, either in the northern breeding range or in the southern wintering area, which includes South America, about which little is known. In Pennsylvania most nesting takes place on building roofs in urban areas, with nighthawks seemingly abandoning traditional rural nesting sites.

Whip-Poor-Will (*Caprimulgus vociferus*) — The whip-poor-will lives in moist woods across the eastern and southern United States. It is about the size of a common nighthawk, but its wingspan is not as great and its wings are broader and more rounded. On each side of the bill, a vertical row of hair-like bristles flares toward the front: the bristles funnel insect prey into the generous mouth. The plumage is a mix of camouflaging browns. Both sexes have a white neck band, and the male has white outer tailfeathers.

Whip-poor-wills perch on branches or sit on the ground or along roadsides, where the birds' eyes gleam red or bright orange in the glare of automobile headlights. This "eyeshine" is caused by a reflective layer at the back of the retina called the tapetum. The tapetum amplifies small amounts of light by passing them back through the retina a second time. Whip-poor-wills fly up to catch moths, mosquitoes, gnats, June bugs and crane flies. The sit-and-wait foraging strategy is less energy-expensive than the common nighthawk's in-flight foraging and may be what allows whip-poor-wills to arrive earlier on northern breeding grounds and to survive periods of cold weather and low prey availability. Its soft feathering lets a whip-poor-will fly almost as quietly as an owl and helps the bird intercept moths, many of which can detect, through tympanic membranes, sounds of potential predators. Whip-poor-wills take sphinx moths, noctuid moths and the big silk moths: cecropia, tuna and polyphemus.

The whip-poor-will is named for the male's repetitive nocturnal calling. The "whip" is sharp, the "poor" falls away, and the "will" — the highest note in the sequence — is a bullwhip snapping in the night. The call carries about half a mile. Listeners close to the calling bird may hear a soft *knock* sound before each repetition. In Pennsylvania whip-poor-wills start calling in late April

or early May, when males arrive from the south; the calling continues through June and dwindles in July. Whip-poor-wills call mainly at dawn and dusk, and they go on and on. A friend of mine who lived on our road, upon hearing a whip-poor-will start up outside his house, counted for four consecutive minutes, recording 55, 56, 56 and 57 repetitions. He noted the time, then sat reading. The bird kept singing, without changing position or tempo, for 91 minutes. Figuring an average of 56 calls per minute, he arrived at a total of more than 5,000 whip-poor-wills.

The calling attracts females. Whip-poor-will courtship involves head-bobbing, bowing and sidling about on the ground. The female lays two eggs on the ground in dry open woods, often near the edge of a clearing. Most egg-laying occurs between mid-May and mid-July. The eggs are off-white, speckled with tan, brown or lilac; they blend in with the dead leaves, as does the adult that incubates them. Several times I have almost stepped on whip-poor-wills incubating or brooding. In one case the incubating bird was a male. On another occasion the adult, a female, flew directly at my face, then fell to the ground and tried distracting me by feigning an injury.

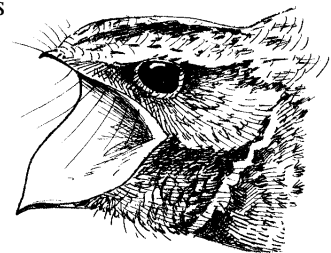
The reproduction of whip-poor-wills may correlate with the lunar cycle: males sing longer on moonlit nights, and hatching may occur when the moon is waxing, on its way to being full, so that the increased light makes foraging easier for the adults, which must now feed nestlings as well as themselves. The eggs hatch after about three weeks of incubation. Parent birds feed their young by regurgitating crushed insects. The fledglings first fly about 20 days after hatching. Whip-poor-wills

begin leaving the Northeast in August and September, with stragglers into October. The species winters in the southeastern states, in areas where the related chuck-will's-widow (*Caprimulgus carolinensis*) breeds in summer. (The chuck-will's-widow withdraws to Central and South America in winter.) Some whip-poor-wills migrate to Central America and the West Indies.

Whip-poor-wills reach their greatest numbers in young brushy forests; abandoned farms, sometimes called "whip-poor-will farms"; and woodland edges, where rank plant growth promotes insect populations. The birds hunt in forest clearings and around water, orchards and gardens. In Pennsylvania the population remains strongest in the Ridge and Valley Province in the southcentral counties. The whip-poor-will does not adapt well to urbanization; the growth of suburbs and cities has eliminated this species from much of southeastern Pennsylvania. Whip-poor-wills also cease to breed in areas where woods become too mature; they have declined over much of the East during the last three decades.



Whip-Poor-Will



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Wildlife Note — 4
LDR0103

Cottontail Rabbit

by Chuck Fergus

The cottontail rabbit, *Sylvilagus floridanus*, is probably our most popular small game animal, and it's also the wild animal most often seen in towns and suburban areas. Because of its popularity and conspicuousness, the rabbit arouses interest both in those who hunt and those who simply enjoy nature.

Biology

The cottontail rabbit is a long-eared, small- to medium-sized mammal of the family Leporidae. It hops when running, because its hind legs are longer than its front legs. A rabbit's soft fur is brownish above and white below, it has a conspicuous 2-inch-diameter white tail, and some individuals have a small white blaze on the forehead. Cottontails are 15 - 18 inches long and weigh two to three pounds, with females slightly heavier than males.

Preferred habitat includes swamps, thickets, briar patches, weedy fields, brush piles, overgrown fencerows and brushy gullies. Feeding areas are rarely very far from good cover. Rabbits seldom dig dens, preferring to occupy abandoned woodchuck burrows. Home range may be a quarter-acre to 20 acres, depending on the availability of food and cover. An individual rarely leaves its home territory, where it knows food sources, cover and escape routes thoroughly.

Summer foods include leaves, herbs, legumes, fallen fruit, garden vegetables, low broad-leaved weeds, clover and grass; captive wild rabbits have eaten grass equivalent to 42 percent of their weight daily during summer. In winter, cottontails eat blackberry and raspberry canes, bark, buds, tender twigs of bushy plants and poison ivy vines.

A rabbit possesses sharp hearing and a keen sense of smell. Its eyes are set well back on the sides of its head, providing a wide field of vision. Rabbits are basically nocturnal, feeding in the evening, at night and in the early morning. Individuals shelter in thick brush or abandoned woodchuck burrows during the day, and they lead solitary lives on their home ranges. Rabbits rely on a burst

of speed and a zigzagging running pattern to evade predators, but they cannot run steadily for long distances. They can swim if they have to.

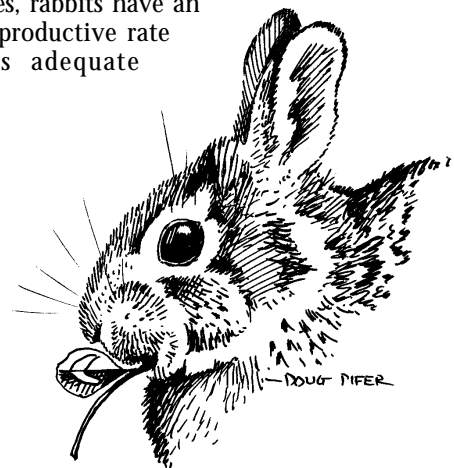
Cottontail litters are usually born from March through September, with about half the total litters being born in May and June. Litter size ranges from two to nine young, with five the average; the gestation period is about 28 days. Each mature female bears an average of four litters per year. Juvenile females born in early spring are sexually mature — and often breed — by late summer of the same year.

A cup-shaped depression about five inches across and four to six inches deep serves as a nest. It's lined with dried grasses and fur, which the female plucks from her chest and belly. Young are born blind, naked and helpless, but they develop rapidly and are weaned, fully furred and on their own when 16 days old. The male takes no part in raising the young. Predators, spring floods, heavy rains and farming operations are major causes of nest mortality.

Few cottontails live to be more than a year old in the wild, although their potential life span is three to four years. Rabbits are a major food source for many other types of wildlife. Like other heavily preyed upon species, rabbits have an extremely high reproductive rate which maintains adequate populations.

Population

The rabbit population today is not as large as it was in the past. The primary reason for this decline is loss of good habitat. Today's



modern equipment lets farmers clean up and cultivate fencerows, swamps and brushy slopes that once held many rabbits. Expanding cities and towns, new roads and dams also reduce habitat or degrade its quality.

Around the turn of the 20th century, many forest areas were logged off. As these areas grew into brush, new rabbit habitat was formed, resulting in tremendous cottontail populations. Later, low brush vegetation — which supported the large rabbit populations — began to die as it was shaded out by growing trees. This loss of low vegetation is a result of normal forest succession.

From year to year, rabbit populations fluctuate in a given area. Changes seem to follow a smooth curve, indicating gradual population increases and decreases. Hunters usually harvest less than 30 percent of the available rabbits. Studies show that even if hunters take as many as 40 percent of the rabbits available in autumn, the next year's rabbit population will not be adversely affected because of the species' tremendous reproductive potential. Young rabbits usually comprise about 80 percent of the population, but few live to see their second winter.

In summer, when litters are being born and food is plentiful, four rabbits may inhabit a single acre. Then an apparent change takes place in early fall. The summer's surplus of young rabbits has been thinned by disease, predation, accidents and parasites. During the fall, one rabbit per acre is considered a good density. The population is at its ebb in late winter after hunters, predators and weather have taken many rabbits.

Habitat

Habitat has more impact on the rabbit population than any other factor. Good rabbit habitat provides abundant food and protective cover. Heavily cultivated land produces ample food, but often not enough protective cover. On abandoned farming land, the reverse of this often holds true.

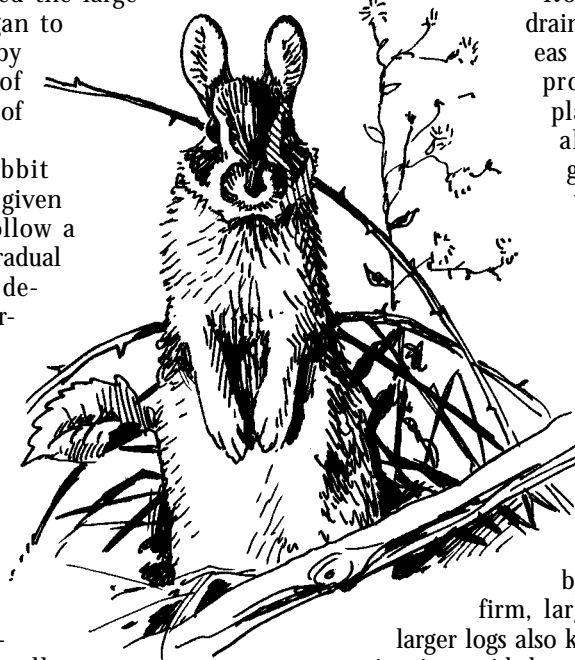
Rocky field corners, gullies, poorly-drained woodlands, outcrops and other areas not being farmed can be managed to produce rabbits. These areas may be planted with pines or shrubs. Cutting along woodland edges stimulates the growth of low vegetation; brushy plants that will grow in these cut-over areas provide food and cover for several years.

Individuals interested in creating more summer food for rabbits can plant areas of clover and grasses. These food plots may require four or more mowings each summer to keep them in a "lawn" condition, and they should also be located near good cover.

Rabbits like to take shelter in brushpiles. Brushpiles are best made by placing smaller brush over several firm, large logs, which provide support. The larger logs also keep the brush off the ground, preventing its rapid deterioration.

Many conifers also produce fine cover, including white, red, Scotch, Virginia, Australian and mugho pines, and Norway spruce. Coniferous plantings require maintenance to remain good cover areas. Information on the best methods of planting, spacing and maintaining plants for food and cover is available from the Game Commission.

Most of Pennsylvania's small game is produced on private land, and the key to a larger rabbit population is more habitat improvement by private landowners.



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Wildlife Note — 12
LDR1105

Crows and Ravens

by Chuck Fergus

Crows and ravens belong to the large family Corvidae, along with more than 200 other species that includes jays, nutcrackers and magpies. Their subfamily, the Corvinae, is represented in Pennsylvania by three species: American crow, fish crow and common raven. These less-than-melodious birds, you may be surprised to learn, are classified as songbirds.

American Crow (*Corvus brachyrhynchos*) — Crows are some of the most conspicuous and best known of all birds. They're intelligent, wary and adapt well to human activity. As with most other wildlife species, crows are considered to have "good" points and "bad" ones — value judgements made strictly by humans. They're found in all 50 states and parts of Canada and Mexico.

Biology

Also known as the common crow, an adult American crow weighs about 20 ounces; its body length is 15 to 18 inches and its wings span up to three feet. Both males and females are black from their beaks to the tips of their tails. Their feathers are iridescent, flashing highlights of blue, green and purple. Albinism occurs, producing pure or partial white coloration. The scientific species name, *brachyrhynchos*, means "short beak;" actually, the crow's beak is fairly large, 2½ inches long and quite sturdy, but short compared to that of the closely related raven.

Crows are found in Pennsylvania year-round. This doesn't mean the same individual birds are here all the time: Crows that breed here migrate south, starting in late September or early October, and are replaced by birds from the north. Northern migrants remain in our state over winter while crows born in Pennsylvania fly as far south as the Gulf of Mexico.

Flocks of crows range widely for food, up to 30 miles a day in winter. Foods include grasshoppers, caterpillars, grubs, worms, most insects, grain, fruit, the eggs and young of other birds, organic garbage — just about anything that they can find or overpower. Crows also feed on the carcasses of winter- and road-killed animals.

Crows have extremely keen senses of

sight and hearing. They are wary and usually post sentries while they feed. Sentry birds watch for danger, ready to alert the feeding birds with a sharp alarm *caw*. Once aloft, crows fly at 25 to 30 mph; with a strong tail wind, they can hit 60. These skillful fliers have a large repertoire of moves designed to throw off airborne predators.

Crows are relatively gregarious. Throughout most of the year, they flock in groups ranging from family units to several hundred birds. During winter, crows may gather by the tens of thousands in areas where food is plentiful. Later, these flocks break up as mate selection takes place.

Males vie for mates through fighting and spectacular flight routines. Once paired, male and female search out a secluded woodlot to raise their brood. Both sexes share nest-building and egg-incubating chores. Some naturalists believe crows mate for life.

A nest site is usually chosen away from those of other crows. Most often, nests are built in the crotch of a tree, 10 to 70 feet above ground, usually more than 25 feet. A typical crow's nest is a large, substantial basket, 22 to 26 inches across, built of twigs, sticks, bark and vines. The deep central cup is lined with moss, shredded bark, grass, deer hair, fur, feathers or similar material.

After mating, the female lays 3 to 8 eggs (usually 4 to 6) in April and May.



Eggs are oval, bluish-green, and blotched and spotted with brown and gray. The young hatch following an 18-day incubation period.

Ten days after they hatch, the young crows are almost fully feathered, and their eyes are open. They leave the nest at five weeks of age, and look like small adults. Young birds follow, imitate and learn from their parents all summer. Often the family group sticks together until the following spring.

Crows are both predators and prey. As predators, they rob nests of songbirds and waterfowl, killing and eating newly hatched young, or cracking eggs. As prey, young crows and unhatched crow eggs are eaten by raccoons, opossums and tree-climbing snakes. Hawks and owls kill fledgling and adult crows. Crows are especially vulnerable to night attacks by great horned owls.

If crows locate an owl during the day, they will mob it — swooping low, calling excitedly and attracting other crows, and generally harassing the bigger, less maneuverable bird. They also mob hawks. In turn, crows are mobbed by smaller birds, especially kingbirds and red-winged blackbirds.

Crows are curious. Shiny objects fascinate them, and they have been known to fly off with bits of glass, rings, keys, etc. Crows exhibit their intelligence by imitating a large number of sounds, including whistles, cats, machines and the human voice. Crows have a good vocabulary — a wide range of *caws*, crowing noises, *coos*, and other soft, melodious sounds they use to communicate with each other.

Population

Crows not only live alongside man, they've survived in spite of him. Because of their habits of pulling up corn shoots and occasionally robbing game bird nests, crows have been persecuted. Today, however, humans also recognize the crow's beneficial side — in helping control harmful insects such as tent caterpillars, locusts and white grubs, in cleaning up dead road-killed birds and animals, and even our improperly disposed garbage.

Some estimates put the crow population at more than three billion in North America. Their numbers may be affected by man-made substances such as aldrin, dieldrin, heptachlor and DDT that have been introduced into the environment (All are now banned). These insecticides accumulated and are still found in natural food chains and in some bird species caused local reproductive failure or thin eggshells that break during incubation. However, it's speculative whether this is the case with crows.

Each year, many crows winter in southern Pennsylvania, where weather conditions are relatively mild and food

is abundant. Here, they may group into flocks of thousands of birds that congregate nightly at roosts — spots where crows have sometimes gathered together for decades. Each day, crows fly in different directions from the roosts, feed and return at night. Most birds usually leave and return along the same route each day.

The crow is classified by the federal government as a migratory nongame bird. It's the only bird in this classification that may be hunted. Except in Hawaii, where crows are protected, they may be hunted during established seasons which may not exceed 124 days per year. States are prohibited from establishing seasons during the peak nesting period. Individual states set season dates and regulate hunting methods, bag limits, etc., under regulations set by the U.S. Fish and Wildlife Service.

Habitat

Crows get along in extremely varied habitat. They thrive everywhere, from the semi-arid regions of the west to the big timber land of the north. They probably prefer farmland, but are also found in parks, on wooded islands, in wooded areas on the fringes of towns and, increasingly, even in our largest cities.

Generally, crows are most numerous in agricultural districts with a great variety and plentiful supply of food. One habitat necessity is an adequate number of trees for cover and nesting sites. Farm woodlots are ideal for this. Nests built and abandoned by crows

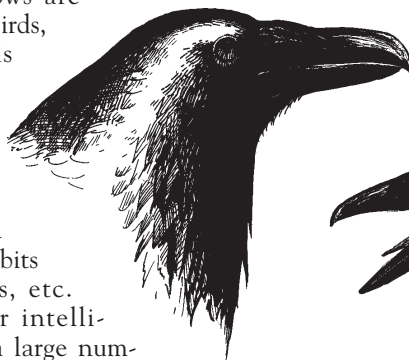
sometimes provide habitat for birds that, ironically, are one of the crow's age-old enemies: the great horned owl.

There's plenty of suitable habitat for crows across the country today. Undoubtedly, the species will be with us indefinitely — especially since more and more people have a better understanding of crows and the beneficial services they provide.

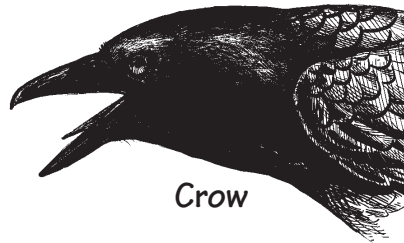
Fish Crow (*Corvus ossifragus*) — which means “bone breaker,” never strays too far from the Atlantic and Gulf coasts and tributary rivers. Its Pennsylvania distribution centers in the southeast and along the Susquehanna River, including the West Branch to Lock Haven and Centre County's Bald Eagle Creek (a tributary), and up the Susquehanna's North Branch to Scranton. Where it occurs, it's fairly common, but it's probably often confused with the common crow. If the two are seen together, the fish crow can be distinguished by its smaller size. Otherwise, the best identifier is its call, a short, nasal *car* or *cah-cuh*, as opposed to the distinct *caw* of the common crow. (A young common crow, however, may sound like a fish crow, so it's difficult to distinguish the two species in late spring and summer.)

As its name implies, this bird feeds on fish; however, it also eats a variety of other foods. Along the shore, it captures fish and small crabs, sometimes steals food from the smaller gulls and terns, and scavenges for whatever

Raven



Crow



it can find. Inland, the fish and common crows often feed together, frequently in agricultural fields. Other songbirds' eggs and nestlings occasionally fall prey to the fish crow.

Nest and eggs are very similar to, though a bit smaller than, those of the common crow. Like their cousins, fish crows build their nest in trees.

Common Raven (*Corvus corax*) — is an uncommon Pennsylvania resident found mainly in the mountainous northcentral region. Once more common, by the late 19th century it was so rare some considered it to be possibly extinct in this state. Today, the raven population is recovering and expanding into the Poconos and our south-central and southeastern counties. Ravens are abundant in Canada and the Rocky Mountains. Favored habitat is remote, heavily forested wilderness, seacoasts and wooded islands.

Ravens are 20 to 25 inches in length, with a wingspread of about four feet. Their plumage is entirely black, with green and purple iridescence. Both sexes are colored alike; males are generally larger than females.

The raven is often confused with its close relative, the crow, but there are major differences between the two species that are especially apparent when crows and ravens are seen together. Ravens are much bulkier than crows, being over twice their weight, and more hawk-like in appearance and habit. Ravens have a massive bill that equips them better for predation and scavenging. The raven's head profile with a large, bulky bill and shaggy throat are characteristic field marks. In flight, ravens also have a more elongated appear-

ance with a longer, wedge-shaped tail, proportionally longer wings, and a long head and bill. Their longer wings are even evident when ravens are standing or walking. They can be recognized by their distinctive head profile or flight silhouette alone. By contrast, crows seem to have broader wings and shorter, squared-off tails. Side by side, crows are much sleeker than the more robust ravens. Ravens are better equipped and more likely to soar than are crows, using their wedge-shaped tail to catch the wind. Ravens engage in spectacular aerial acrobatics, including flips, loops, rolls, and dives. Males will carry large sticks in flight while in courtship and nest-building.

Ravens eat rodents, insects, grain, fruit, bird eggs and refuse. They consume much carrion, especially in winter. In northern Pennsylvania, they are often seen along Interstate 80, where they feed on road-killed deer, raccoons, opossums, etc. Ravens also prey upon sick and injured animals.

A raven is every bit as alert as a crow and possesses sharp eyesight and hearing. Ravens are considered among the most intelligent of all birds; like crows, they can learn to imitate a variety of sounds, including the human voice. In nature, their calls include guttural croaks, gurgling noises, and a sharp, metallic "tock."

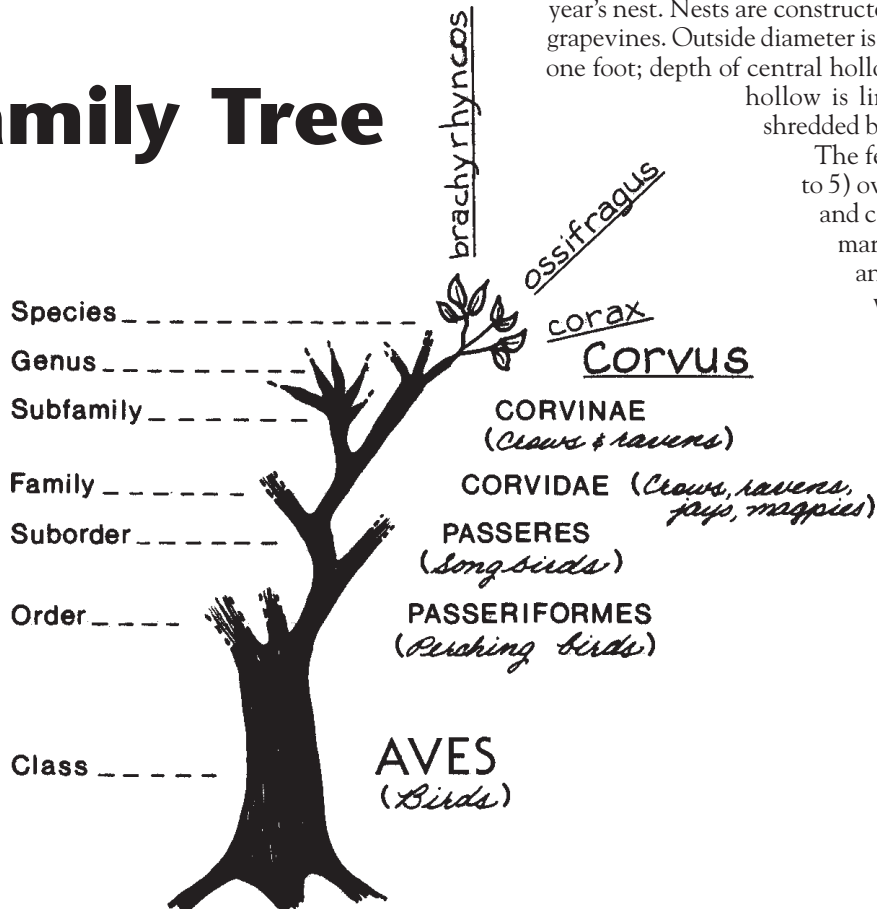
Ravens are skillful fliers; their courtship display flight is especially spectacular. After mating, a pair will seek out an isolated nesting spot, usually at least a mile away from any other ravens. Nests are built on cliffs or near the tops of large trees. Of 17 raven nests found in Pennsylvania, 13 were on cliffs, three were in hemlocks (45 to 80 feet up), and one was 85 feet up in a white pine.

Ravens often build a new nest on top of the previous year's nest. Nests are constructed of large sticks, twigs and grapevines. Outside diameter is 2 to 4 feet; inside diameter, one foot; depth of central hollow, six inches. The central hollow is lined with deer hair, moss, shredded bark and grass.

The female lays 3 to 6 (usually 4 to 5) oval eggs, which are greenish and covered with brown or olive markings. Eggshells are rough and dull-looking. Incubation, which is mainly by the female, lasts about three weeks. Young are altricial. They leave the nest about one month after hatching.

Ravens seem to need seclusion for successful reproduction, but they are becoming more tolerant of people. Each year, more seem to be nesting in closer proximity to civilization and entering towns in winter to feed on litter and garbage. Ravens may live as long as 35 years in the wild, but much less is normal.

Family Tree





Wildlife Note — 34
LDR0603

Diving Ducks

by Chuck Fergus

Pennsylvania ducks may be grouped into two types: diving ducks and puddle ducks. Diving ducks spend much more of their time farther out from shore than puddle ducks. Both groups can be found on streams, rivers, lakes and marshes. This note covers 15 species commonly called diving ducks.

Diving ducks eat seeds and other parts of aquatic plants, fish, insects, mollusks, crustaceans and other invertebrates. They dive underwater to obtain much of their food. They have large broad feet, fully webbed and with strongly lobed hind toes, that act as paddles. Their legs are spaced widely apart and located well back on the body, improving diving efficiency but limiting agility on land. Their bodies are compact, and their wings have relatively small surface areas. While this arrangement helps their diving and swimming, it hinders their ability to become airborne. Instead of springing straight out of the water into flight, as puddle ducks do, diving

ducks must run across the water to build up speed before taking off.

Diving ducks, puddle ducks, geese and swans begin migrating north through Pennsylvania in late February. Each year there is a peak in migration, when ponds across the state are crowded with waterfowl. While this period varies from year to year, it often follows heavy nighttime rains in late March or early April.

Diving ducks nest in New England, Canada, Midwestern and prairie states, the Pacific Northwest and Alaska. Several species inhabit both the Eastern and Western hemispheres. Three species of mergansers (which, though not actually diving ducks, are usually grouped with them) breed in Pennsylvania's northern tier.

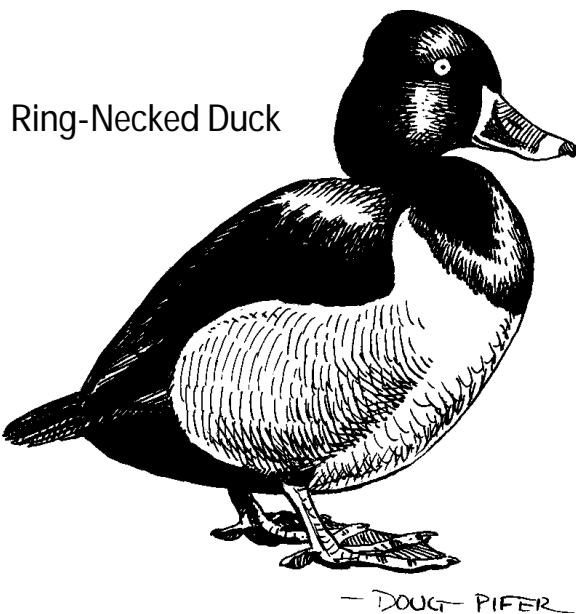
Beginning in winter and before heading north, and into spring, males in their brightly colored breeding plumage vie for females. Courtship may include ritualized drinking and preening movements, posturing and calling. Copulation takes place in the water. Males and females form monogamous pairs that last until the female begins incubating eggs; then, the male leaves the area and usually joins a band of other males.

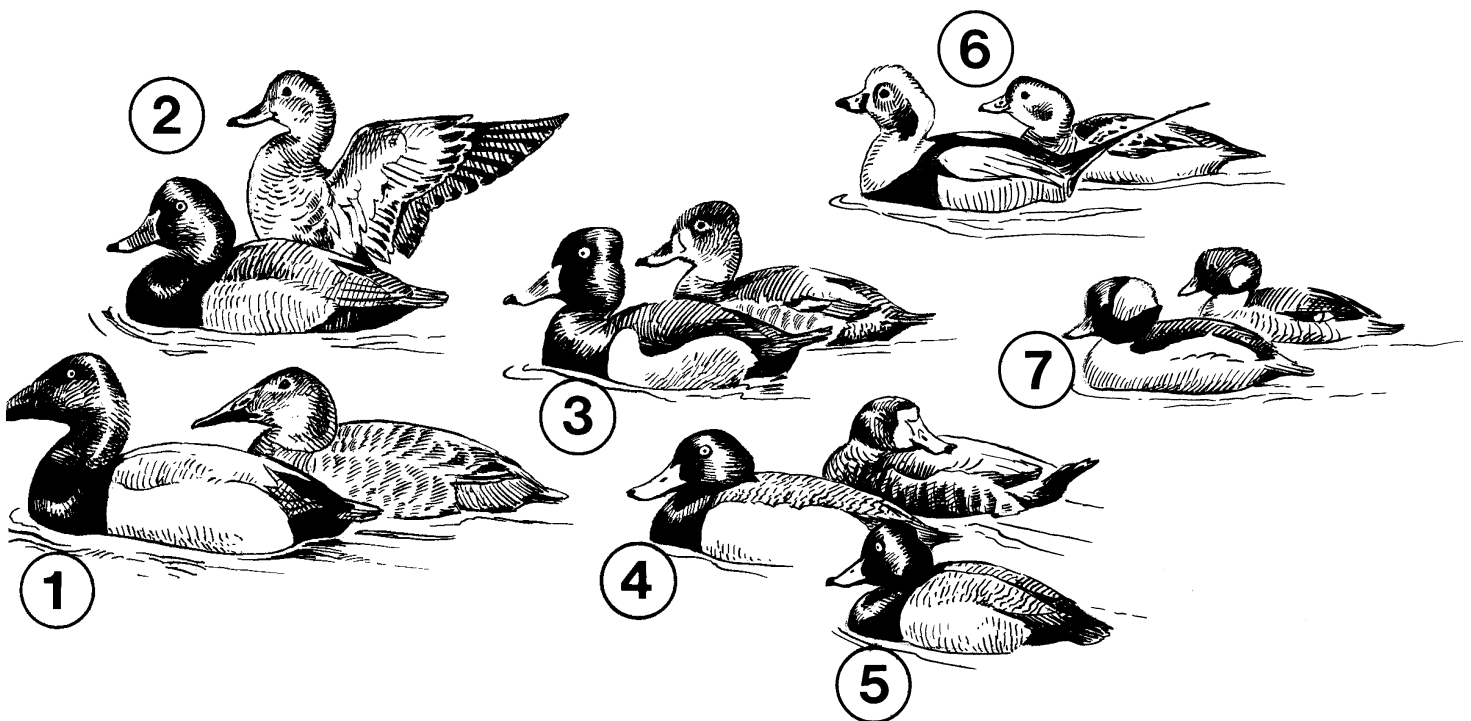
Nesting habits and habitats vary from species to species. Generally, female diving ducks lay 5 to 15 eggs in vegetation, tree cavities, or rock crevices over or near the water. Because females do not start incubating a clutch until they lay their last egg, young develop simultaneously and all hatch at about the same time.

Ducklings are covered with down, patterned with shades of yellow or brown to break up their body outlines. Their eyes are open, and they can swim and feed themselves soon after hatching. The group, called a brood, remains together until the ducklings can fly, usually 8 to 10 weeks after hatching.

Adults undergo a post-breeding molt, growing a new set of feathers. Males molt first; in all species, the male's bright nuptial plumage is replaced by drabber, less-conspicuous feathering. While their flight feathers are growing, ducks cannot fly; they keep quiet and stay hidden during this period of vulnerability.

Ducks are preyed upon by raccoons, foxes, mink,





1 - Canvasback, 2 - Redhead, 3 - Ring-Necked,
4 - Greater Scaup, 5 - Lesser Scaup, 6 -
Oldsquaw, 7 - Bufflehead, 8 - Hooded
Merganser, 9 - Common Merganser, 10 - Red-
Breasted Merganser, 11 - Common Goldeneye, 12 -
Black Scoter, 13 - Surf Scoter, 14 - White-Winged
Scoter, 15 - Ruddy

hawks and owls; young are also taken by snapping turtles. Crows, raccoons and skunks eat the eggs.

In Pennsylvania, the fall migration of waterfowl begins in late August, peaks in October, and ends in December. Some ducks winter in our state, but most go farther south. Diving ducks winter along the Atlantic and Pacific coasts, across the southern states and in Mexico and Central America.

Habitat is of prime importance to ducks. Wetlands originally covered some 127 million acres in the U.S., but today more than half of those acres have been drained and converted to farmland, or developed for housing and industry. Drought periodically dries up parts of remaining wetlands, affecting duck reproduction. Ducks are vulnerable to oil spills on coastlines where they winter or breed. Pesticides, heavy metals and industrial pollution also harm them, either directly or by killing food plants or animals.

The Canadian prairie provinces — Manitoba, Saskatchewan and Alberta — form the single largest breeding habitat for many duck species. Alaskan and Canadian arctic wetlands are crucial to geese, swans and ducks. Our southern coastal states form an important wintering ground.

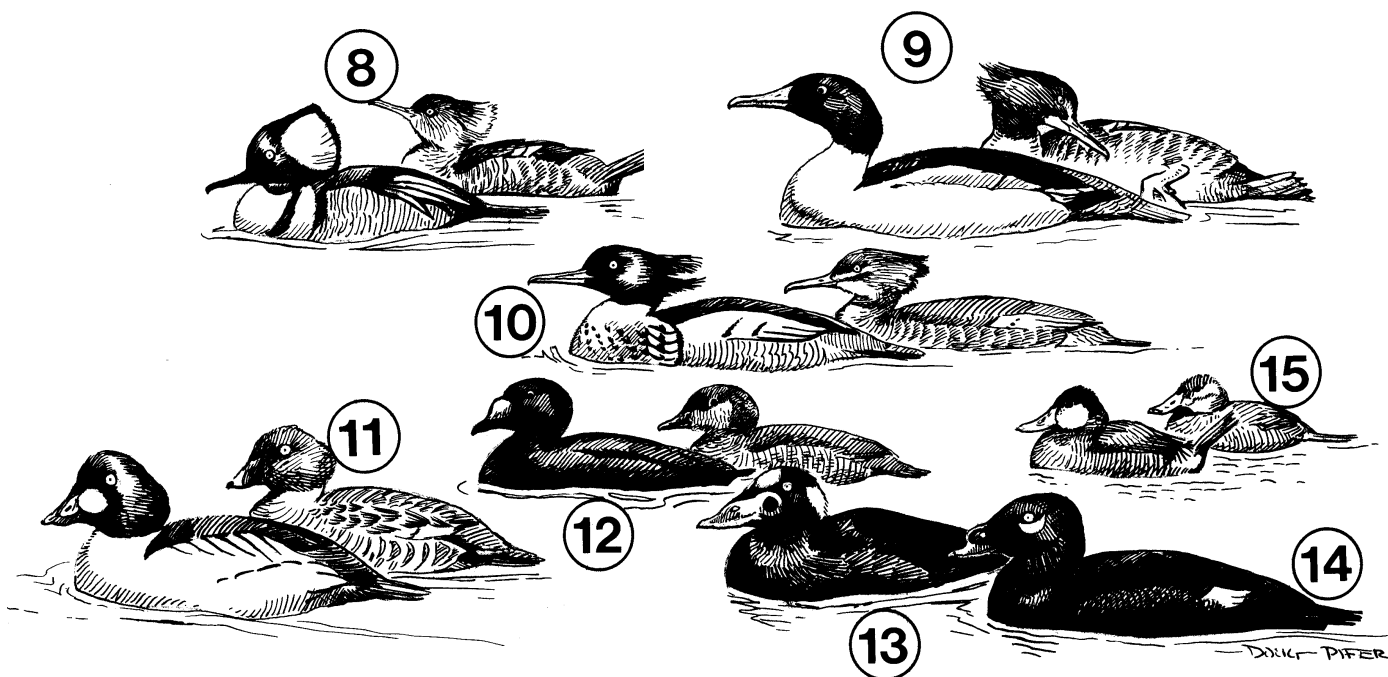
By the early 1900s, unregulated market killing had decimated duck populations along the Atlantic seaboard.

Today, waterfowl populations in the region are stable, thanks to law enforcement and modern habitat management and preservation. The U.S. Fish and Wildlife Service monitors waterfowl numbers. The service divides the United States into four administrative units called flyways (they correspond to four major migration corridors for waterfowl) and gives states within the flyways guidelines for setting hunting seasons and bag limits.

Duck hunting is a challenging, rewarding sport. To pursue waterfowl, today's hunter is required to buy a federal duck stamp and a Pennsylvania migratory game bird license; revenues are used to monitor waterfowl populations through surveys and to acquire wetland habitat. Many people other than hunters also enjoy waterfowl, observing and photographing these colorful, diverse birds.

Canvasback — Length, 20 to 21 inches; weight, 2½ to 2¾ pounds. Also called a "can." Plumage is black and white; male has a red head, female, brown. Flight is swift (up to 70 mph in calm skies, faster with a tail wind), with little dipping and weaving; flocks number 5 to 30.

Canvasbacks eat seeds and other parts of pondweeds, wild celery, eelgrass, widgeongrass, other aquatic plants, mollusks and crustaceans. In Pennsylvania, the canvasback is an uncommon spring and fall migrant. It breeds in the prairie states, Rocky Mountains, Canada and Alaska. In the Atlantic Flyway, wintering canvasbacks concentrating on the Chesapeake Bay comprise almost half of the entire North American population. Hazards on the breeding range include drought (the canvasback does not adapt as readily to drought-related habitat changes as do other ducks); and loss of nesting habitat. The canvasback population, once greatly reduced by earlier market killing and consequently given periodic closed-season protection, has rebounded and is hunted.



Redhead — Length, 19 to 20 inches; weight, 2 to 2½ pounds. Plumage is black and gray; male has a red head, female, brown. Flies in singles, pairs and in flocks of 5 to 15. Redheads feed in shallower water than do other diving ducks, eating the seeds, tubers and leaves of plants, along with insect larvae and snails. In Pennsylvania, redheads are uncommon migrants in spring and fall. They breed mainly in the northern United States and southwestern Canada, and winter across the southern United States and in Mexico. Females often lay eggs in the nests of other ducks, and leave them to be incubated by the nest owners; they also desert their nests more readily than do hens of other species.

Ring-Necked Duck — Length 16 to 17 inches; weight, 1¼ to 2 pounds. Also called a “ring-bill.” Plumage is black and white for the male, brown and white for the female. The male has a faint brown ring around the neck (not easily seen in the field), and both sexes have a pale ring near the tip of the bill. They fly swiftly in flocks of up to 20. They feed in shallow waters on seeds and vegetative parts of pondweeds and other water plants, and on insects, mollusks and other aquatic animals. Common migrants through Pennsylvania during spring and fall, ring-necked ducks breed across southern Canada and the northern United States. Some occasionally winter in Pennsylvania, but most go to the coasts, the southern states and Mexico.

Greater and Lesser Scaup — These two nearly identical species are 16½ to 18 inches in length, and weigh 1½ to 2½ pounds. They are also called “broadbills” and “bluebills.” Males are black and white, females, brownish and white. The bill is blue for both species. Greater scaup inhabit large bays, sounds and inlets of both coasts, and

the Great Lakes. The lesser scaup is the one normally seen in Pennsylvania. It frequents the larger bodies of inland waters. Scaup eat mollusks, insects, crustaceans and aquatic plants. Common spring and fall migrants through Pennsylvania, they breed across Canada into Alaska. They winter along the coasts.

Oldsquaw — Length, 16 to 20 inches; weight, 1¾ to 2 pounds. Also called a “long-tailed duck.” Plumage, a striking mix of black and white, shows much seasonal variation when found in the state. Food: crustaceans, mollusks, insects and fish. Oldsquaws may dive to 100 feet when foraging. They are uncommon spring and fall migrants. Occasionally they winter in the state, but more often along the coasts and on the Great Lakes. They breed in Canada, the Pacific Northwest and Alaska.

Bufflehead — Length, 13 to 15 inches; weight, about 1 pound. Also called a “butterball.” Plumage is mostly black and white on the male, and brown and white on the female; the male has a large white patch on its head. Buffleheads are fast fliers with rapid wing-beats. They eat aquatic insects, snails, fish and other animal foods. Buffleheads are common spring and fall migrants, breeding in northern Canada and Alaska, and wintering along the coasts and in the southern states.

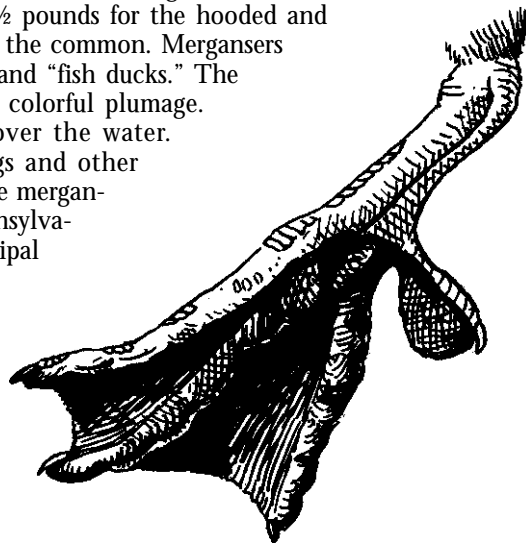
Common Goldeneye — Length, 17 to 19 inches; weight, about 2 pounds. Also called a “whistler” for the sound of its wing-beats. Plumage is black and white on the male, brown and white on the female. Goldeneyes dive for crustaceans, insects, mollusks and fish. Common spring and fall migrants, they breed across Canada and in Alaska, and winter in Pennsylvania and across the continental United States.

Ruddy Duck — Length, about 15 inches; weight, about 1 pound. Small and stubby, the ruddy duck has a short, thick neck, an upturned tail, and white cheek patches under a dark cap. It prefers to dive — rather than fly away — from danger. In flight, ruddy ducks skim low over the water in compact flocks. Food is primarily vegetation (widgeon grass, pondweeds, bulrush seeds), midge larvae and mollusks. Juveniles eat a larger proportion of energy-rich animal food than do adults. Ruddy ducks are common spring and fall migrants across Pennsylvania. They breed mainly in southwestern Canada, and winter along the United States coasts and in Mexico.

Hooded, Red-Breasted and Common Mergansers — Hooded and red-breasted mergansers average 16 to 18 inches in length, while the common merganser is 23 to 25 inches. Weight, about 1½ pounds for the hooded and red-breasted, 2½ to 4 for the common. Mergansers are known as “sawbills” and “fish ducks.” The species have distinctive, colorful plumage. They fly fast and low over the water. Food: fish and their eggs and other aquatic animals. All three merganser species breed in Pennsylvania, although their principal

range is farther north. Breeding habitat is heavy timber around lakes, ponds, rivers and streams. Hooded and common mergansers usually nest in tree cavities, while the red-breasted nests on the ground, usually in thick cover. Eggs: 6 to 17. Incubation is by the female and takes about four weeks. Hooded and red-breasted mergansers winter along the coasts and in the southern United States; the common merganser winters in Pennsylvania, on the Great Lakes, and across the continent where the water remains open.

Black, Surf and White-Winged Scoters — Length, 18½ to 22 inches; weight, 2 to 3½ pounds. All three scoter species are basically black, with varying amounts of white in the plumage. These sea ducks fly in long, undulating lines, in irregular groups, or in V-shaped flocks. They eat mollusks, crustaceans, aquatic insects and plants. They are rare to uncommon migrants over Pennsylvania, passing through the state in March and April, and again in October and November. Scoters breed in Canada and Alaska. They winter on the Great Lakes and along the Atlantic and Pacific coasts.



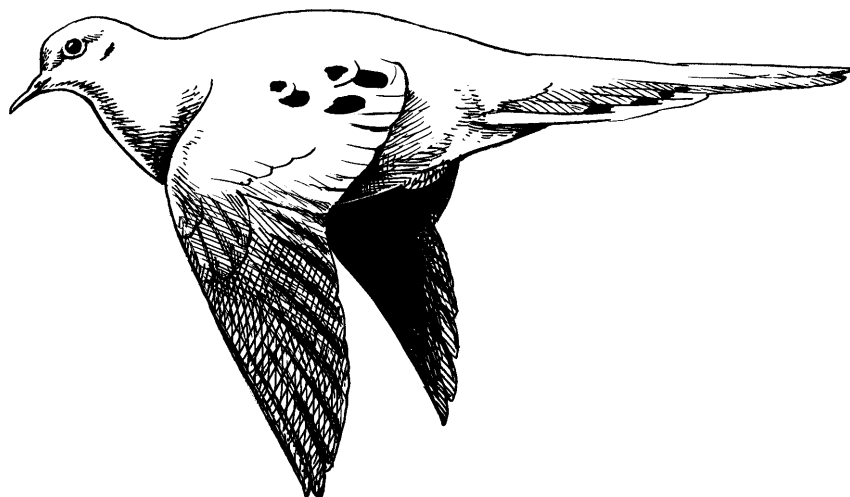
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Wildlife Note — 18
LDR0103

Dove

by Chuck Fergus



In August, mourning doves seem to be everywhere: we see their slim, gray-brown forms on telephone lines, in back yards, farm fields and weedy flats along highways. By late September, their swift, direct flight takes them overhead on whistling wings. They flash south in bands of 10 and 20, belly plumage catching the fading gold of late summer sunlight, and when the great masses of doves begin to depart, autumn is on its way.

The mourning dove is a member of the family Columbidae and is closely related to the rock dove (domestic pigeon). It breeds across all of the lower 48 states, much of Mexico, the southern and western edges of Canada, and into Alaska; it winters from Massachusetts, southern Michigan, Nebraska and California south to Panama. Colloquial names are turtle dove, wild pigeon and wild dove.

Biology

An adult mourning dove, *Zenaida macroura*, weighs 3½ to 5 ounces and is 10 to 13 inches in length from beak to tail tip. A dove is smaller and more streamlined than a pigeon, with a long, pointed tail and tapering wings that spread 17 to 19 inches. The neck is long, the head small, and the bill slender, short and black.

A dove's wings are gray, and its back, rump and middle tailfeathers are grayish olive-brown. The lateral tailfeathers are bluish-gray, with black crossbars and white tips which flash when the bird is flying. The undersides of the body are pale buff; the head is buffy-brown with a black spot behind the eye and pale, blue skin visible around the eye. Legs and feet are reddish. Both sexes have similar plumage, although the male's colors are somewhat brighter and more iridescent, especially the head and breast.

The species' call is distinctive, and earns the "mourning" half of this bird's name. The call is a hollow, plaintive *ooah*, *cooo*, *coo*, *coo*. Depending on distance, only the last three notes may be audible. This call is made by males trying to attract females. After mating, it serves to

bond the pair and ward off other males. While females may *coo* in response, their calls are weak and scarcely audible. Another distinctive sound identifies the mourning dove: a whistling produced by the wings of a bird in flight.

Doves are beneficial to man; they eat seeds of pest plants and generally do not damage crops. Foods are weed seeds and waste grains (these two items together may make up 98 percent of a dove's diet), a few insects, snails and slugs. Doves don't cling to stalks or scratch for food; they pick seeds off the ground. Favored weeds are croton, foxtail, smartweed, ragweed and seeds of various grasses and sedges. Grains eaten include corn, wheat, oats, barley, rye and buckwheat left on the ground by mechanical harvesting methods.

Seeds of plants such as croton and foxtail grass are very small, and single doves have been found with literally thousands (7,500 croton; 6,400 foxtail grass) in their crops. Grit aids in grinding up food, and it may be taken in the form of gravel, cinders, glass or any other small, hard material. Doves seen along roadsides are often picking up grit. In addition to food and grit, doves need water every day. Ordinarily they fly to a stream, creek or pond early in the morning and again in the evening.

Small bands of doves begin to return to Pennsylvania in early March, with arrivals peaking from mid-March through April. Some doves also winter in Pennsylvania. Studies indicate that most birds returning to Pennsylvania to breed have wintered along the southeastern coast — in North and South Carolina, Georgia and Florida.

The male selects a nesting territory and defends it by flying at and pecking other males. He coos to attract a female and performs a nuptial flight in a large oval pattern. The pair mate and select a nest site; together they build a nest over the next 4 to 6 days, sometimes using a vacant catbird, robin or grackle nest as a platform. Dove nests are built of sticks, with little if any lining material. Eggs may be visible from the ground through the loosely woven twigs, but the nests are surprisingly strong for their frail appearance. They're built as high up as 50 feet (usu-

ally 10 to 25 feet) in the crotch of a branch, typically in conifers; or they may be constructed in tangles of shrubs or vines, or even on the ground.

Two or three days after the nest is finished, the female lays her first egg. A second egg comes two days later, and incubation begins at once. (On rare occasions, a third egg is laid.) Eggs are oval to elliptical, glossy, white and unmarked. Incubation and brooding are shared; the male sits on the eggs during the day, the female at night. After 14 to 15 days, eggs hatch. The nestlings, also called squabs, are altricial: naked, blind and completely dependent on their parents.

For the first few days, squabs are fed a mixture of small seeds and a nutritious liquid called "pigeon's milk," which is secreted by the lining of the adult's crop (the crop is the upper portion of the digestive tract). This milk is a chalky mixture of cells and fluid; both parents feed it to the young by regurgitation. Gradually, seeds begin to compose the bulk of the developing squabs' diet. At 14 days, squabs are fully feathered, fledged and on their own — and the adults are ready to produce another brood.

The nesting cycle — egg-laying, incubation and care of squabs until they leave the nest — takes just more than a month. Adults make up to five nesting attempts over the summer, finishing in August; about half of the nestings succeed, resulting in an average of 4 to 6 young produced by each adult pair.

Weather can be an important mortality factor. Spring and summer storms with high winds blow nests, eggs and young out of trees; heavy rains and hail may kill adults as well as nestlings. Nest predators include blue jays, starlings, crows, squirrels, snakes, house cats and others. Adults are preyed on by hawks and owls. Disease, accidents and hunting cut dove numbers further.

Life expectancy: 70 to 80 percent of all newly hatched doves do not live one year (i.e., for every 100 hatched in a summer, only 20 to 30 will live to breed the following summer). If a juvenile survives its first year, the attrition slows: adults have a 50 percent mortality rate. Average annual mortality for a stable population is estimated at 60 percent.

Juveniles grow for and complete their feather development in about two weeks after leaving the nest; then they gather into small flocks to feed and roost. Migration of all ages is in full swing by mid-September or early October. Flocks of a few to 20 or more birds travel together, flying in the morning, resting and feeding at noon, flying in the afternoon, feeding in the evening, and roosting at night. If the winter weather is not too severe, some birds spend the entire year in Pennsylvania.

Because the mourning dove is a migratory bird, it falls under federal regulations. As with waterfowl, the states set hunting seasons and bag limits within a framework determined by the US Fish and Wildlife Service. Doves have been hunted in Pennsylvania since 1945.

Population

Mourning doves adapt well to man and his activities. In the last 200 years, the dove population has increased greatly — probably as a result of intensified agriculture and expanding suburbs which provide much shrubby

nesting habitat. Other practices which decrease the amount or diversity of shrubs and trees, however, may affect doves adversely. Today, the dove has the largest range of any game bird, although breeding populations are apparently decreasing slightly.

The US Fish & Wildlife Service monitors dove breeding populations by conducting coo-count surveys. In Pennsylvania, the dove population peaks in August and September when adults and locally produced young are joined by migrants from farther north. They migrate leisurely, averaging about 15 miles per day.

As with any heavily preyed-upon species, the mourning dove has an extremely high reproductive rate (small, but multiple broods); in essence, parent doves don't put all their eggs in the same basket. While dove numbers fluctuate from year to year, there's no evidence that the population is cyclical.

Habitat

The mourning dove is a bird of open woodland edges. Favored habitat includes farmland with scattered trees and shrubs, open woods, evergreen stands, orchards, roadside trees and suburban gardens. Doves usually avoid dense forests.

Food isn't normally a limiting factor, because doves can subsist on a tremendous variety of seeds and can fly to places where food is adequate. Because they're so mobile and adaptable, there's little need to manage habitat specifically for them. Shelterbelts can be planted for nesting cover (red pine, long-leaf pine, Norway spruce and locust trees are suitable), benefiting doves and other wildlife such as songbirds, pheasants, rabbits, etc. Also, millet overseeded in corn provides extra food.

In general, doves concentrate in areas with plentiful weed seeds or waste grain, near trees for roosting and nesting, and within easy flight of a water source. As long as such habitat exists — and right now it is abundant — the mourning dove will continue to be one of our most plentiful and conspicuous wild animals.



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Wildlife Note — 32
LDR0603

Eagles and Osprey

by Chuck Fergus

Large, striking birds of prey, the bald eagle, golden eagle and osprey seem to embody power and majesty. All three occur in Pennsylvania, although none are common here. On a continental scale, human encroachment on habitat and environmental contamination reduced the birds' numbers and lowered their breeding success. The Pennsylvania Game Commission, along with many other states, has been working to reverse that trend since the 1980s, and as a result, the birds are much more common now than they were in the 1960s, '70s and '80s.

Taxonomists place bald and golden eagles with the *buteos* — hawks with broad wings and broad, rounded tails. Other Pennsylvania *buteos* are the broad-winged, red-tailed, rough-legged and red-shouldered hawks. The osprey is the only species that's a member of the family *Pandionidae*.

Bald Eagle (*Haliaeetus leucocephalus*) — The bald eagle's taxonomic name means "white-headed sea eagle." The word "bald" is a misnomer. The mature eagle's head is covered with gleaming white feathers. Its body is dark brown, its tail white. Immatures are brown, mottled with white on their wings and body. Full adult plumage is attained in the fifth year. Both adults and immatures have yellow bills and feet; legs are feathered halfway down.

Eagles were listed as a federally endangered species until 1995, when their status was upgraded to "threatened." In Pennsylvania, they remain a state endangered species.

Adults are 30 to 40 inches in length and weigh 8 to 14 pounds. Wingspan is 6 to 8 feet; standing height, about two feet. As with other birds of prey, the female is larger than the male.

Bald eagles fly with strong, deep strokes, or soar on flattened wings. Their eyesight is among the keenest in the animal world, five or six times sharper than a human's. An eagle's call is a rapid, harsh cackle, *kweek-kik-ik-ik-ik*, or a lower *kak-kokkak*.

Eagles feed mainly on fish (60 to 90 percent of their diet) either living or as carrion. They also eat birds and small mammals. Eagles soar above the water or sit on a convenient perch; when they spot a fish near the water's surface, they swoop down and snatch it in their talons. They use their talons for killing, and their heavy bills for tearing apart prey for eating. Sometimes an eagle will go after an osprey, forcing it to drop a captured fish, which the eagle grabs in midair.

Eagles mate for life, although when one partner dies, the other readily finds a new mate. Nesting is preceded by a spectacular aerial courtship, with the birds locking talons, diving and somersaulting in the sky.

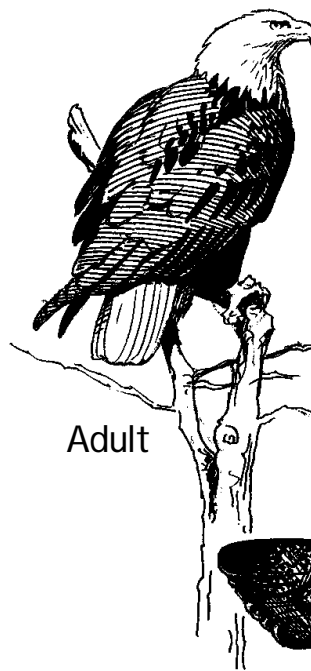
An eagle's nest is called an *eyrie*. The big raptors choose large, sturdy trees. Nest sites are near lakes, rivers, reservoirs and seashores.



Bald Eagle



Osprey



Adult



Immature

Bald Eagle

A new nest is about five feet wide and two feet high, with an inside depression 4 to 5 inches deep and 20 inches in diameter. Often a pair returns to the same nest year after year, adding a new layer of sticks, branches and corn-stalks, plus a lining of grass, moss, twigs and weeds. Enlarged annually, some nests grow so big and heavy that they break the branches supporting them.

The female lays two eggs (sometimes only one and occasionally three) in March or April. Eggs are about $2\frac{3}{4}$ by $2\frac{1}{2}$ inches, dull white and unmarked. Both parents incubate. If all goes well, the eggs hatch after about 35 days. Young birds (eaglets) are fed by their parents. A large, healthy hatchling may kill a smaller, weaker one.

Eaglets develop most of their feathers by 3 to 4 weeks, walk in the nest at 6 to 7 weeks, and begin to fly at about three months. Young separate from their parents in autumn.

Eagles are uncommon in Pennsylvania, although they may show up here in all seasons. In spring, they migrate north to nest in April, with stragglers into May. August and September find eagles returning south, with most heading for Florida to winter. Pennsylvania's eagles seem to spend much of the winter near their nesting areas; apparently they do not migrate.

There were only three known bald eagle nests in Pennsylvania from 1963 through 1980, all in the Pymatuning/Conneaut Marsh region in the northwestern part of the state. From 1983-89, the Game Commission removed 88 eaglets from nests in Saskatchewan, and raised and released them through hacking. Hacking is a falconer's term for maintaining a young bird in a semi-wild condition, providing food until it can fend for itself. Every year since

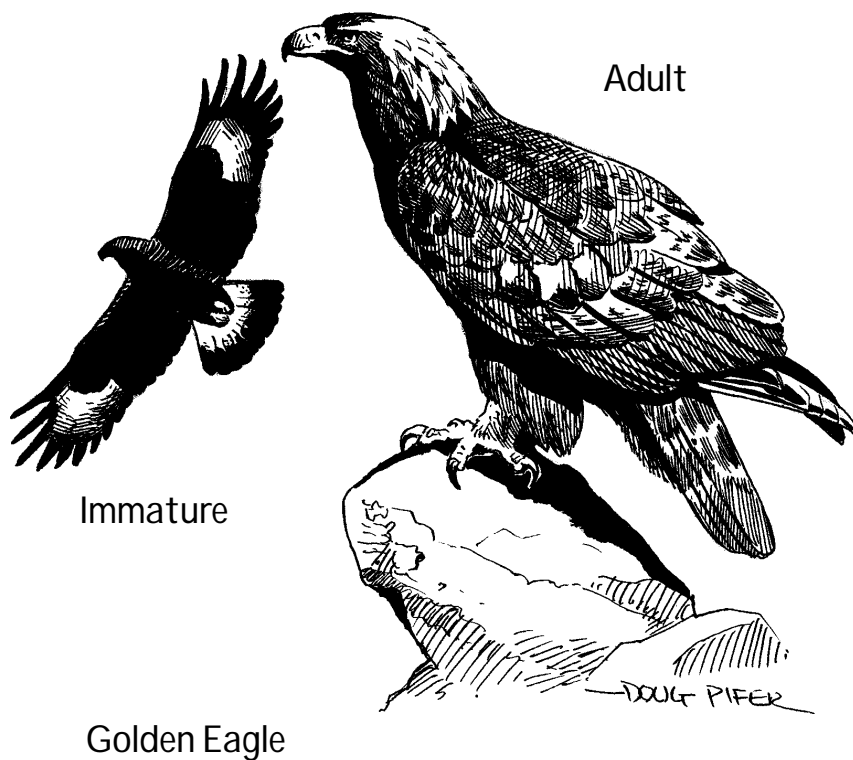
1990, new bald eagle nests have been found. By 1996, the state's nesting eagle population had climbed to 20 pairs. Six years later, eagles were nesting in at least 22 of Pennsylvania's 67 counties.

In winter, an occasional eagle may turn up almost anywhere in Pennsylvania. Three popular wintering areas are Pymatuning; the upper Delaware River (primarily in the Pike County area); and the lower Susquehanna, between Lancaster and York counties. Wintering birds may form loose groups, or wander as individuals. Younger birds are more inclined to wander.

Bald eagles can live 30 years or longer in the wild. They have few natural enemies. Some are killed by thoughtless humans, and others are electrocuted when they land on power lines.

An estimated 50 percent of eaglets survive their first year. Factors depressing reproduction are many. If humans intrude on the nest area, eagles may abandon eggs or leave young vulnerable to severe weather or predators. Eagles do not breed until 4 or 5 years of age. Their natural reproduction rate is slow. Breeding habitat — tall, sturdy trees near bodies of water in remote areas — is dwindling. Toxic chemicals introduced into the environment cause repeated nest failures (see "Raptor Reproduction" section at the end of this Note).

The bald eagle was chosen the United States' national symbol in 1782. At that time, an estimated 25,000 lived in what is now the lower 48 states. Today the same area probably supports 4,000 breeding pairs, mostly in the South, the West and the Pacific Northwest. Fairly large populations still inhabit northwestern Canada and Alaska.



Golden Eagle

(Note: Persons wanting to see an eagle nest may do so from the Pennsylvania Game Commission's Pymatuning Waterfowl Museum, just south of Linesville. Eagles have been maintaining a nest on Pymatuning Lake's Ford Island for some time. The best time to watch is from early March to mid-May, before trees leaf out. Spotting scopes or binoculars are necessary.)

Golden Eagle (*Aquila chrysaetos*) — The golden eagle is a magnificent predator of remote, mountainous areas. The species occurs in Eurasia, North Africa and North America, where it's most common in the western United States, Canada and Alaska. The golden eagle is rare in the Northeast.

Adults and immatures have rich, dark-brown body plumage, with gold-tipped feathers on the head and neck. The legs are feathered to the toes. Adults resemble immature bald eagles, but the goldens are darker. Immature goldens have white wing patches and, for their first several years, a broad, white band at the base of the tail.

Golden eagles are classic buteos, with long, rounded wings. They flap less and soar more than bald eagles. Body length is 30 to 40 inches; wingspan, 6½ to 7½ feet; standing height, about two feet. Their call is a series of rapid, sharp chirps.

Prey includes small rodents, hares, rabbits, birds, reptiles and fish. Goldens crush prey in their sharp talons, and use their large, hooked beaks to rip it apart for eating. In the West, these fierce, powerful predators have been known to knock young mountain sheep and goats off high ledges, then feast on the remains below.

In Pennsylvania, golden eagles are regular migrants in

October; some also pass through in April and May. They do not breed in our state, although individuals are sometimes sighted in summer. Some occasionally winter here in rugged, remote terrain.

Most goldens breed across central Canada, in the western United States, Alaska and Mexico. In the Northeast, active nest sites have been reported in New York, New England and Quebec.

Breeding habits are similar to those of bald eagles, except goldens often locate their nests on cliffs. After fledging, young remain in the nest area during summer, then wander away from the site with their parents. They do not breed until five years of age.

Estimates place the North American population at anywhere from 8,000 to 50,000. The golden eagle is not on the federal threatened or endangered list, but has disappeared from most of the northeastern states.

Osprey (*Pandion haliaetus*) — The osprey is a large, eagle-like hawk found throughout North America and in the Eastern Hemisphere. It inhabits seacoasts and the areas near large rivers and lakes. In Pennsylvania, it shows up along the Susquehanna and Delaware rivers, and near creeks, ponds, lakes and reservoirs throughout the state, depending on the season.

Plumage is dark above, white below. Adults and juveniles are colored alike. The head is largely white, with a black patch across each cheek. A conspicuous crook to the wings and black "wrist" marks are good field identifiers.

Except when migrating, ospreys flap more than they sail. Wingbeats are slow and deep. Ospreys hover 50 to 150 feet up and then plunge to the water for their fish prey, sometimes going all the way under.

Ospreys are 21 to 24 inches from bill to tail. Their wings span 4½ to 6 feet. Standing height is about 1½ feet. Their call is a series of loud whistles, *cheep, cheep*, etc.

In spring, ospreys migrate through Pennsylvania in April and May. Several hundred individuals summer here. Fall finds these so-called fish-hawks heading south along the mountain ridges in August, September and October. Most winter in South America's Amazon River region.

Like eagles, ospreys build bulky nests of sticks and twigs, lined with inner bark, sod or grasses. Sometimes they add debris (rope, fish net fragments, cans, seashells, etc.). Nests are in living or dead trees, on the ground, or on man-made structures — utility poles, fishing shacks, billboards, channel buoys, chimneys and the like. Often added to and used year after year, the nests can become huge.

Eggs: three, sometimes two, and rarely four; 2¼ by 1¾ inches; white or pinkish-white with brown spots and

blotches. The female incubates 32 to 33 days, and young leave the nest when 51 to 59 days old.

Dr. Larry Rymon of East Stroudsburg University in 1980 began reintroducing ospreys to the state's northeastern counties. The first Pennsylvania-hacked osprey returned in 1983, and two years later the state documented its first nesting pair since 1910. By 1996 more than 260 ospreys had been hacked in the state. In 1996, Pennsylvania had 26 nesting pairs. An osprey has strong ties to the area where it was born, and usually returns there to breed.

Raptor Reproduction

Reproductive failure is a problem for bald eagles and ospreys. Much of the problem stems from man's use of now-banned toxic chemicals. DDT, dieldrin, and other chlorinated hydrocarbons sprayed to kill insects, drain into rivers and get into fish. Bald eagles and ospreys eat a lot of fish, and accumulate the chemicals in their bodies. Other pollutants such as PCBs and heavy metals may also affect their reproduction.

The chemicals cause birds to lay infertile or thin-shelled eggs, which break under the weight of an incubating bird. Although environmental regulations have banned the use of "hard" pesticides, the chemi-

cals remain in our natural food chains because they do not break down rapidly. Still, it appears the alarming decline in raptor reproduction in the 1960s and '70s has leveled off, perhaps indicating some progress toward cleaning up the environment, or at least stabilizing present pollution levels, has been made.

How You Can Help

Wildlife biologists are always looking for information about eagles and ospreys. If you find a bald eagle or osprey nest, report it to your local Wildlife Conservation Officer or Game Commission region office. Be careful not to disturb the birds.

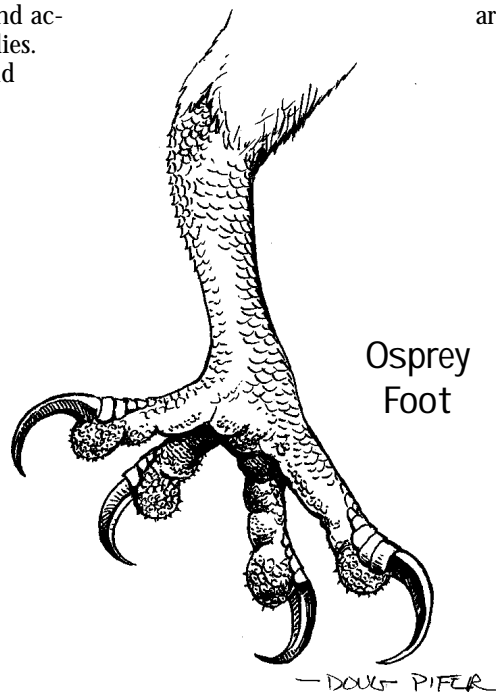
If you find an injured eagle or osprey or hear of one, call the Game Commission. Injured birds can often be treated and rehabilitated.

Eagles, ospreys and other birds of prey are protected by federal and state laws.

Report any violations.

Educate others about eagles and ospreys. Some people still believe these priceless natural treasures are detrimental to game and fish populations. They are not.

Contribute to the Game Commission's "Working Together for Wildlife" fund, and to private wildlife organizations and raptor rehabilitation centers.



Osprey
Foot

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Coyote

by Arnold Hayden

The eastern coyote has stirred as much interest and emotion as any other animal in Pennsylvania. Seeing a coyote or hearing the howl of this wild, wily animal is a great reward of nature to many people. Others fear this animal just knowing it is in the wild. Some sportsmen hate coyotes because they think the predators kill too many game animals. Trappers and hunters find coyotes to be especially challenging. Some farmers lose livestock due to coyote predation. The coyote has been referred to as the brush wolf, prairie wolf, coy-dog and eastern coyote.

The eastern coyote (*Canis latrans*) is found throughout northeastern United States and southeastern Canada. Recent research shows the eastern coyote is an immigrant whose origin may have involved interbreeding between coyotes and gray wolves. Analysis of DNA suggests coyote/wolf hybridization has occurred. Other studies indicate that the eastern coyote is intermediate in size and shape between gray wolves and western coyotes. As a result, the eastern coyote exhibits different behavior, habitat use, pelt coloration, prey preferences and home range sizes from its western cousin. The eastern coyote is the largest canine found in Pennsylvania. The following information pertains to the coyote in Pennsylvania and throughout northeastern United States.

History

Fossil records indicate coyotes have existed in what is today eastern North America since the Pleistocene period, a million years ago. Occurrence has been intermittent over that time, and only in the past 75 to 100 years has the animal appeared to become common. The coyote status in Pennsylvania during the 1700s and 1800s is clouded with that of the wolf. Old bounty records indicate both coyotes and wolves from other sections of the country were fraudu-

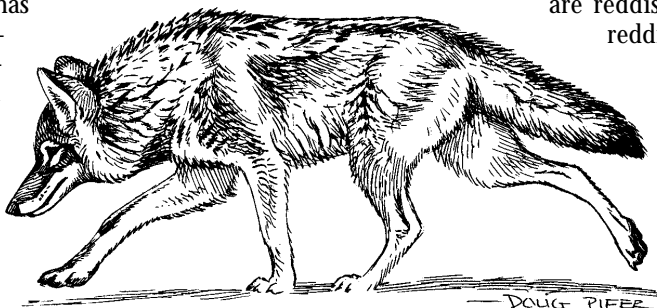
lently turned in as wolves here during the late 1800s.

Little is known of the wolf in Pennsylvania, or if indeed the same animal now called the "eastern coyote" may in fact have been similar to the wolf of the past. Pictures dating to the 1930s have appeared in *Game News* over the years. These animals look like the same coyotes being killed today. The first coyote identified as an animal similar to what we today call the "Eastern coyote" was killed in Tioga County in 1940.

In the late 1960s, it appears an influx of coyotes entered northern Pennsylvania from the Catskill Mountains in New York, and from there they spread south and west across the state. In the 1970s, the highest population was in the Pocono Mountains of the state. The coyote continued to expand its range during the late 1970s and occupied the entire state by 1990, with the highest populations across the northern half of the state.

Biology

The eastern coyote is much larger than its western counterpart. Adult males in Pennsylvania weigh 45 to 55 pounds. The heaviest known male caught here weighed 62 pounds. Females are smaller, 35 to 40 pounds. The heaviest known female in Pennsylvania weighed 42 pounds. Total body length of eastern coyotes ranges from 48 to 60 inches. Their pelage colors range from light blond, reddish blond, gray to dark brown washed with black, and black. Generally, coyotes are gray to a German shepherd coloration. Their legs are gray, tan and reddish with black markings or lines down the front of the front legs. The cheeks and behind the ears are reddish or chestnut colored. Blond, reddish and black coyotes may not have any noticeable black stripes on their front legs. Their ears are erect and their bottle brush tail is usually held in a downward position. Normally, their eyes are yellow, but some with brown eyes have been found.



Coyotes are monogamous; they maintain pair bonds for several years. The social unit evolves around the mated pair and its offspring. However, the delayed dispersal of some offspring may result in extended family relationships beyond a year. A social group occupying a territory may include a pair of adults (generally more than a year old), transients (aged 6 to 18 months), pre-dispersing sub-adults (usually less than a year old) and non-breeding associates that are more than one year old. Observations indicate other coyotes living in a territory may help provide food to a growing litter.

Normally, females do not breed — or implant embryos — until their second winter, but there are cases of some yearling females breeding and producing litters. They have one heat period that lasts 4 to 5 days, usually in February. The litters are born from mid-April to early May, and litter sizes average 5 to 7 pups. Coyotes compensate for unusually high mortality by having larger litters. Known denning sites range from beneath overturned trees, piles of tree stumps, rock dens, and dug out red fox dens. Dens are usually located on southerly exposures. The pups are moved frequently to new dens to avoid detection.

Young coyotes begin to disperse from the family group during October, when they're six months old. Studies in Pennsylvania indicate some juvenile coyotes dispersed up to 100 miles, but 30 to 50 miles is more common.

Coyotes use a variety of yips, barks and howls to communicate and periodically assemble into larger packs. Coyotes at times will "pack" and at other times will hunt alone or in the company of another coyote or two. They are primarily nocturnal, but often hunt during daylight hours, especially in the morning. Howling may occur at any time of day, but the highest activity is usually at night. A coyote's sense of smell, hearing and alertness are especially keen.

Habitat

The coyote has adapted to a wide variety of habitats in Pennsylvania. The animals can be found in the heavily forested northeast and northcentral regions of the state, in dairy and cropland areas, and even around the heavily

populated areas of Philadelphia, Harrisburg, Pittsburgh and Erie. Coyotes prefer heavy brushy cover, such as clearcuts, and often live along edges between forest and agricultural areas where prey is abundant.

Food Habits

The coyote is a generalist. An analysis of 300 coyote scats collected in Pennsylvania indicate a wide array of food items in their diet. Mammals from at least 13 genera were found, ranging from small mice and voles to deer. Overall, deer was the dominant food, occurring in 57 percent of the scats. That deer were a dominant food item was not surprising given the high deer density in many areas, the large number of deer killed on the highways, starvation losses, and deer that have died for any number of other reasons.

Rabbits and woodchucks ranked behind small mammals and deer as important food items. Birds were found in 10 percent of the scats and insects in 18 percent. Plant material occurred in 50 percent of the scats. Various kinds of fruits were important during the late summer and fall, but plant material appeared important on a year-round basis. While no livestock was found in the analysis, predation on sheep, chickens, ducks, goats and domestic rabbits does occur, but at a low rate. However, depredation can be significant in localized areas or at certain farms.



Population

Coyotes are found throughout Pennsylvania, but are most common in the northern half. The total population in 1995 was probably between 15,000 to 20,000. The harvest in the early '90s exceeded 6,000; incidental to turkey, bear and deer hunting. Coyote hunters and trappers accounted for the other half. Mortality from hunting and trapping approaches 60 percent for young coyotes, but only 15 percent for adults.

Coyote populations throughout North America have continued to expand, despite man's attempt to control them. If there's one thing we have learned about this intriguing animal, it's that the coyote controls its own destiny, not man.

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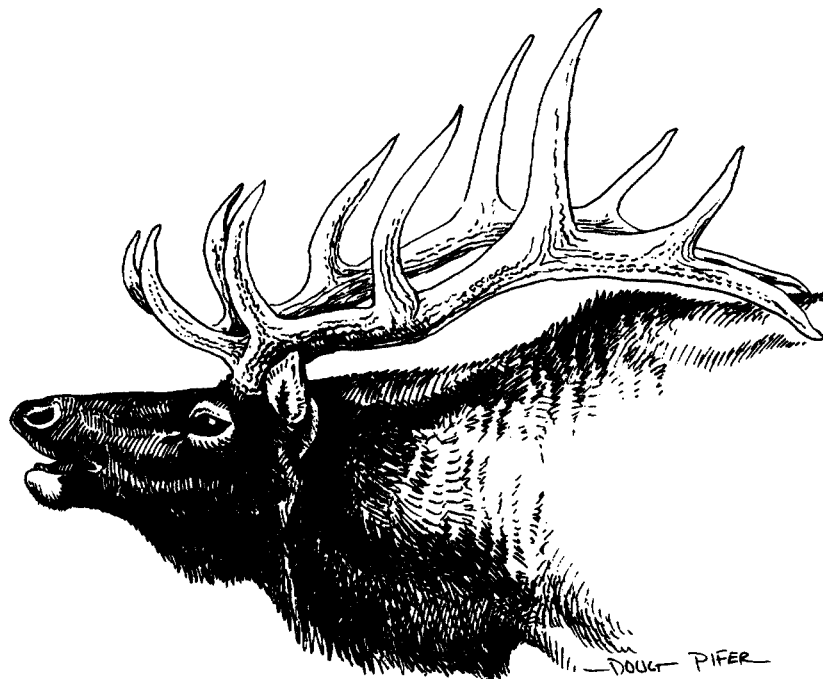
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Wildlife Note — 33
LDR0103

Elk

by Chuck Fergus



Before white settlers arrived in Pennsylvania, the Eastern elk (*Cervus elaphus*) lived throughout the state, with concentrations in the northcentral and Pocono mountains. By 1867 the species had been extirpated; ultimately it became extinct throughout its range, which included New York and New England.

Today, elk inhabit portions of Elk and Cameron counties, and are being seen more and more in Clinton and Clearfield counties. The animals are descendants of Rocky Mountain elk (*Cervus elaphus nelsoni*, a closely related subspecies) released by the Pennsylvania Game Commission between 1913 and 1926.

The word "elk" comes from the German "elch," the name for the European moose. The elk is also called "wapiti," an Indian word meaning "white deer," probably referring to the animal's sun-bleached spring coat or its light-colored rump.

The elk is the second largest member of the deer family in North America; only the moose is larger. Many Western states and several Canadian provinces support thriving elk populations, and in those places the elk is a popular big game animal.

Biology

Elk are much larger and heavier than white-tailed deer. A mature male elk, called a bull, stands 50-60 inches at the shoulder and weighs 600-1000 pounds. Females, or cows, weigh 500-600 pounds.



Elk have a summer and a winter coat. The summer pelage is short, thin and reddish brown. In winter, long, coarse guard hairs overlay woolly underfur. At this time, an elk's body is tawny brown or brownish gray, with the neck, chest and legs dark brown, and the underparts darker than the back. Buff or whitish fur covers the rump and the 4-5 inch tail. Sexes are colored essentially alike. Young elk, called calves, are dappled with spots.

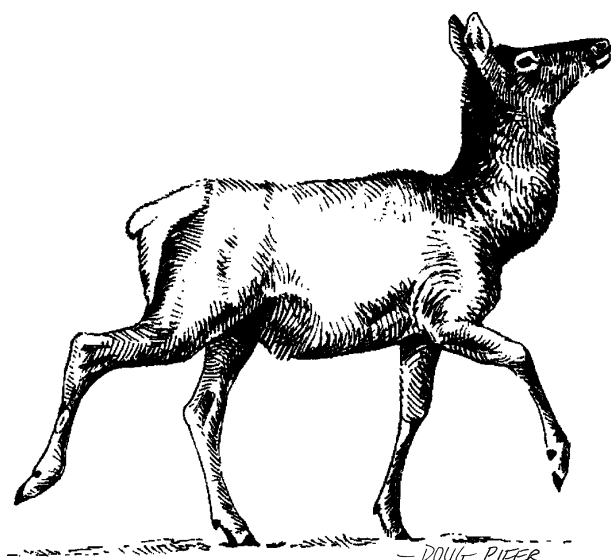
Strong muscular animals, elk can run 30 miles per hour for short distances, and can trot for miles. They jump well and swim readily. Their senses of smell and hearing are keen.

Cow elk often bark and grunt to communicate with their calves, and calves make a sharp squealing sound. The best known elk call, however, is the bull's bugling. Bugling occurs primarily during the mating season. It consists of a low bellow that ascends to a high note, which is held until the animal runs out of breath, followed by guttural grunts. Cows also bugle at times.

Each year, a bull grows large branching antlers that sweep up and back from the head. In May, two bumps start to swell on the animal's skull, pushing up about half an inch per day. The growing antlers are covered with a soft skin called velvet. This covering contains blood vessels which supply growth materials to the enlarging antlers.

Yearlings usually grow single spikes 10-24 inches in length, while older bulls may produce racks with main beams 4-5 feet in length and having 5, 6 or, rarely, 7 tines to a side. An elk with a total of 12 antler points is called a "royal" bull; one with 14 points is an "imperial." Before the autumn rutting season, the velvet dries and is shed or rubbed off. Bulls carry their antlers into late winter or early spring.

Elk are primarily grazers, eating a variety of grasses and forbes. In winter, they paw through snow to reach grass, or turn to twigs, buds and the bark of trees. Among trees and shrubs, Pennsylvania elk seem to prefer aspen, red maple, fire cherry and blackberry. They also browse



oak, striped maple, black cherry, Juneberry and witch hazel. They drink from streams and springs and, if necessary, during the winter they get water by eating snow.

The mating season is September and October. Bulls bugle invitations to cows and challenges to other bulls. The bulls fight with each other, joining antlers and pushing and shoving. Battles rarely end in serious injury; the weaker bull usually breaks off the confrontation and trots away.

Like their western counterparts, Pennsylvania bull elk amass harems of 15-20 cows. Most harems are controlled by large mature bulls, although younger males, which hang around on the fringes of the groups, may also share in the breeding.

About 8½ months after she is bred, a cow gives birth to a single calf — rarely twins — in May and June. A calf weighs about 30 pounds and can stand when only 20 minutes old. Within an hour it starts to nurse, and it begins feeding on vegetation when less than a month old.

In spring and summer, bulls go off by themselves, living alone or in small groups. Cows and calves tend to remain in family units composed of a mature cow, her calf and immature offspring from the year before. Sometimes several families band together. An old cow will lead the group, barking out alarm calls and guiding the band away from intruders. In hot weather, elk bed down in the shade of dense timber. They prefer not to move about in heavy wind.

Potential lifespan for an elk is 20 years. Pennsylvania elk die from old age, disease, vehicle collisions and poaching.

Brainworm is a parasitic nematode (*Parelaphostrongylus tenuis*) that sometimes kills Pennsylvania elk. The nematode is common in the eastern United States and Canada. Its primary host is the white-tailed deer, which it does not normally harm. Elk pick up the parasite from snails — an intermediate brainworm

host — which they inadvertently consume while grazing. The worm eventually reaches the brain and spinal column, causing death.

Habitat

Elk are attracted to forest clearcuts, revegetated strip mines, grassy meadows, open stream bottoms and agricultural lands. Shy animals, they tend to avoid contact with humans, although they will venture into settled areas to reach favored food sources.

Pennsylvania's elk live in Cameron, Clearfield, Clinton, Elk and Potter counties, in the state's northcentral region. The elk range covers about 835 square miles.

The Game Commission and state Department of Conservation and Natural Resources (DCNR) are managing public lands to make them more attractive to elk. The agencies create and maintain high quality foraging areas and limit disturbance by humans. Elk habitat enhancement projects also benefit deer, wild turkeys, grouse and other wildlife.

Population

From 1913 to 1926 the Game Commission released a total of 177 elk in Blair, Cameron, Carbon, Centre, Clearfield, Clinton, Elk, Forest, Monroe and Potter counties. From 1923 to 1931, the Commission opened a hunting season on antlered bulls, and hunters took 98.

By 1940, the released elk and their offspring died or were killed everywhere in the state except for those in Elk and Cameron counties, which was, interestingly, the area where last native elk was killed. In 1971, when the Game Commission and DCNR began what became annual elk surveys, 65 were counted by ground and aerial spotters. By 1980, the number of elk counted rose to 114. In 1992, the ground spotters were eliminated from the survey and the herd was estimated to number 183. In 2001, survey work indicated the herd contained more than 700 elk. That same year, the Game Commission, once again, had an open, but closely regulated hunting season.

The Game Commission and DCNR continue to conduct annual population surveys and perform habitat improvement projects on state lands. The Rocky Mountain Elk Foundation has also played a major role in helping to improve Pennsylvania's elk management program by making large monetary contributions. These funds have been used to help buy important land on the primary elk range, erect deterrent fencing, improve habitat and construct an elk viewing area on SGL 311 near

Benezette. Other organizations contributing to the elk management program include the National Wild Turkey Federation, Safari Club International, Consolidated Natural Gas Transmission and Pennsylvania Wildlife Habitat Unlimited.

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Wildlife Note — 60
LDR0103



Finches and House Sparrow

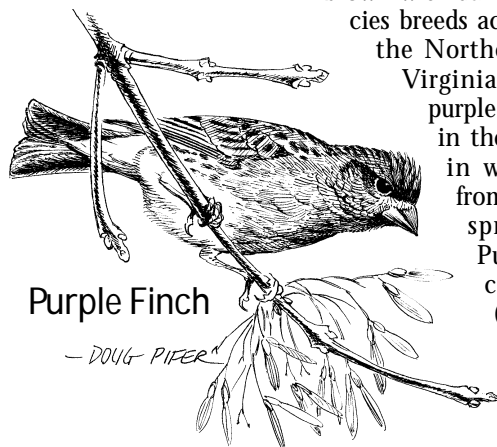
Finches in Undulating Flight

by Chuck Fergus

Finches are small to medium-size songbirds with sturdy bills that let them crack open the tough hulls of seeds, their main food. Five species breed in Pennsylvania; one, the house finch, is a western species liberated in the Northeast that has become quite common. Finches are sociable birds, and outside of the breeding season they gather in flocks. They feed on the ground and in tall weeds, shrubs and trees. Even during summer, when insect populations burgeon, many finches continue to eat seeds and even nourish their young with a pulp composed of regurgitated seeds. In winter, many of the birds in this group frequent our bird feeders.

Male finches sing to attract females and to maintain pair bonds. In most species the female builds a cup-shaped nest hidden in the thick foliage of a tree or shrub. Female finches do most or all of the incubating, and males and females team up to feed the young.

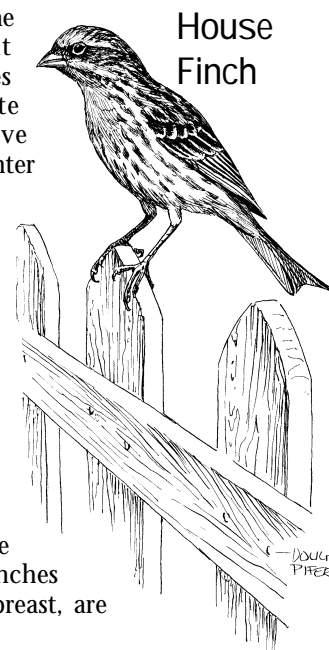
Purple Finch (*Carpodacus purpureus*) — Don't look for a purple bird when trying to pick out this species: The male purple finch is maroon-red, while the female is brown with darker streaks. The species breeds across Canada and in the Northeast south to West Virginia. In Pennsylvania, purple finches nest mainly in the northern tier, and in winter, individuals from farther north overspread the state. Purple finches inhabit conifer plantations (including Christmas tree farms), spruce bogs, hillside pastures, woods edges and



mixed and open woods. In winter they eat weed, grass and tree seeds (elm, ash, sycamore and tulip tree); in early spring they consume buds and flowers of trees and shrubs; they take some insects in late spring; and they feed on fruits in summer.

The male has a melodious warbling song. The female builds a nest 15 to 20 feet above the ground, on a horizontal branch, usually in a conifer; she weaves a compact open cup out of twigs, weeds, rootlets and strips of bark, and lines it with fine grasses or animal hair. The three to five eggs are a pale greenish blue, dotted with black and brown. The female incubates them for around 13 days. Both parents feed the nestlings, mainly with seeds, and they fledge about two weeks after hatching. In the East, only one brood is raised per year. In winter, purple finches may join foraging flocks with American goldfinches, pine siskins and other species. At feeding stations, house finches and house sparrows dominate purple finches and often drive them away. Purple finches winter as far south as Florida.

House Finch (*Carpodacus mexicanus*) — House finches in the eastern United States are descendants of birds released in New York City in 1940. The species is native to the US Southwest; today *Carpodacus mexicanus* breeds from coast to coast. Females are sparrowlike, and males are similar to male purple finches, except that house finches show more streaking on the breast, are



not quite as robust, and are a more bright red. The red pigment in both species comes from beta-carotene found in many plants, particularly in red fruits; the red blush to the plumage intensifies as males age. House finches live in cities, suburbs and farms. They feed on seeds, flowers, buds, berries, small fruits and a few insects.

Pairs often form within flocks during winter. Males do not stake out territories but, instead, defend areas around their mates. House finches begin nesting as early as March and produce two or more broods per year, each with four or five young. Females nest in a variety of sites including conifers, ivy on building walls, abandoned nests of other birds, above porch lamps and in hanging flower baskets. The population of this western species "exploded" until around the mid-1990s, when an eye disease seemed to have curbed the growth in the East.

Pine Siskin (*Carduelis pinus*) — With their brown colors and streaked breasts, pine siskins look like sparrows; patches of yellow in the wings and tails are good field identifiers. Pine siskins nest in New England and Canada and in scattered sites southward in the Allegheny Mountains. In Pennsylvania they breed mainly in the northern tier, nesting in stands of hemlocks, pines, spruces and larches, and in ornamental conifers in backyards. These tame birds become much more visible when they flock to feeding stations in winter. As well as eating seeds put out by people, siskins consume the seeds of trees (alder, birch, spruce and others), weeds and grasses. They also eat buds, flower parts and some insects. They usually forage in flocks, even during the nesting season; in winter they're often seen in the company of goldfinches. In some years many siskins winter in the Keystone State, and in other years few show up.



Pine Siskin

American Goldfinch (*Carduelis tristis*) — The male goldfinch in summer is one of our most conspicuous birds: bright yellow, with black wings and a black forehead. The female is a dull olive-gray. In winter both sexes look like the summer female. Goldfinches are gregarious and are often seen flying in groups, in a characteristic bouncing or undulating flight pattern: bursts of wingbeats followed by short glides when the birds lose a few feet of height. While airborne, flock members sound a *perchickory* call. American goldfinches nest across North America and statewide in Pennsylvania. They forage in a variety of habitats including brushy areas, roadsides, open woods, woods edges and suburbs.

American goldfinches are with us year-round. Some winter in Pennsylvania; others move in from the south in April and May, returning to breed in areas where they

hatched, although they remain in flocks and do not set up territories until late June or early July. In the spring, goldfinches eat seeds, insects and insect eggs. In

summer they turn

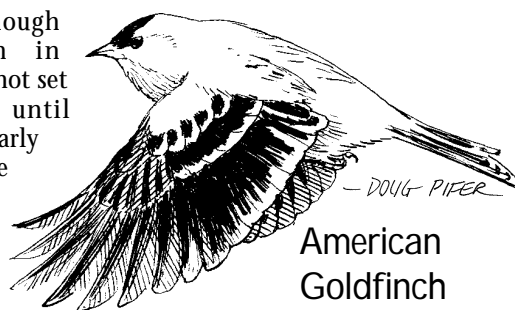
mainly to the seeds of thistles, dandelions, ragweeds, sunflowers and grasses. They eat elm seeds, birch and alder catkins, flower buds and berries. They clamber around in weeds and shrubs, picking out seeds. In winter, flocks may seem to roll across a field, as birds in the rear leapfrog over other flock members on the group's leading edge: this strategy gives each individual access to fresh foraging areas while requiring only short flights to get there.

Goldfinches start nesting later in the season than any other bird in the Northeast; perhaps breeding occurs late so that young hatch when seeds mature on favored food plants, particularly thistles. Flocks break up as males claim territories, in loose colonies, up

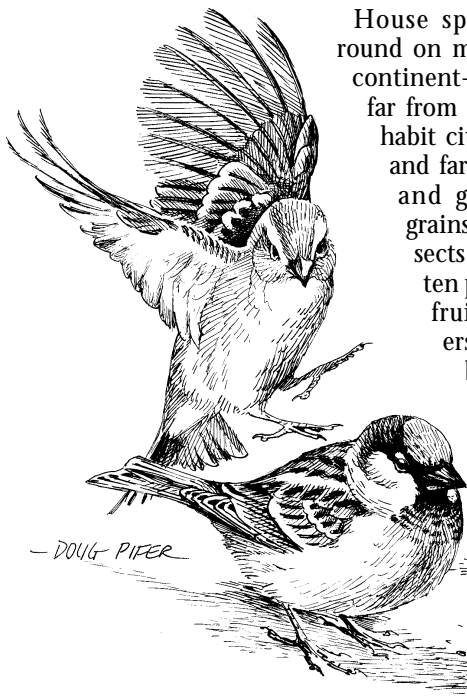
to a quarter-acre in size. The male sings from a perch, voicing a clear canary-like song, and makes high, circling flights. The female builds a neat cup lined with thistle or cattail down, 4 to 14 feet up in a horizontal or upright fork of a small tree or shrub. Goldfinches often nest in thornapples, shrub willows and gray dogwood clumps. The nest is woven so tightly that it will hold water; flexible, it expands as the young increase in size. The female lays four to six pale bluish eggs. She incubates the clutch, with the male bringing her food. The young hatch after 12 to 14 days, are fed mainly on seeds by their parents, and leave the nest after another 11 to 17 days.

Some pairs raise a second brood, and fledglings have been found as late as September. Cowbirds sometimes parasitize goldfinches, but the young cowbirds often die because they don't get enough protein from the regurgitated seeds that goldfinch parents feed to nestlings.

House Sparrow (*Passer domesticus*) — Although named a "sparrow," this ubiquitous bird is actually a member of the weaver family, a large group of Old World birds. House sparrows have spread from Eurasia, and can now be found living with humankind around the globe. People introduced them in North America between 1850 and 1886 in an attempt to control insect pests, particularly the elm spanworm caterpillar. At first the bird was called the "English sparrow," because most imports were brought from England. Male house sparrows have black chin and breast patches (the amount of black varies among individuals), white cheeks and a chestnut nape. Females are a dingy brown.



American Goldfinch



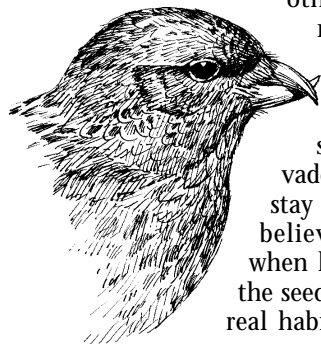
House sparrows live year-round on most of the species' continent-wide range. Never far from humanity, they inhabit cities, suburbs, towns and farms. They eat weed and grass seeds, waste grains, chicken feed, insects and spiders (about ten percent of the diet), fruit tree buds, flowers, crumbs and garbage. They nest in protected places, including holes in trees and buildings, porch and

House Sparrows

barn rafters, behind shutters and awnings, in bluebird houses, and in thick growth of ivy on the sides of buildings. Often they destroy the eggs and young of native cavity nesters. House sparrows use their nests for shelter during most of the year. Both sexes work at lining the cavity with grass, weeds, feathers and trash. Pairs are monogamous; prolific breeders, they produce two or three broods of three to seven young annually. Recently-fledged juveniles form flocks in summer and are joined by adults after the breeding season ends in August and September. In late fall, pairs return to their nest cavities.

When house sparrows overran the United States in the early 20th century — ousting native breeders, fouling buildings with their droppings, and offending people with their aggressive, noisy habits — those who had championed the species' introduction were roundly castigated. The population peaked in the early 20th century. Since then, it has fallen. Several factors may be involved. Tractors and automobiles have replaced horses, and farming operations have been sanitized, so that grain is no longer widely available in winter.

Red Crossbill

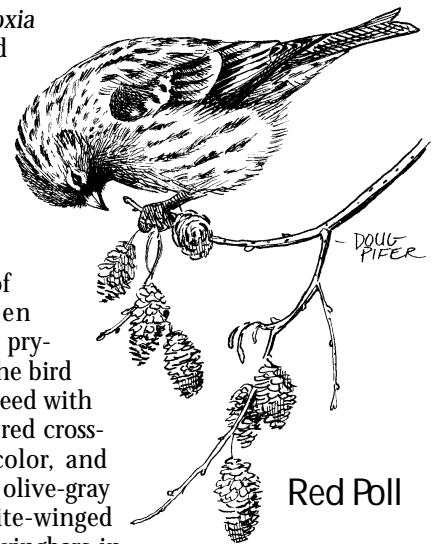


Winter Finches — In addition to our five breeding species, four other finches breed in the far north and visit the Northeast in winter, when they may descend on feeding stations in peoples' yards. In some years many finches invade our area; in other years they stay in the north. Ornithologists believe that finches come south when key food sources, particularly the seeds of conifers, fail in their boreal habitat.

Red crossbills (*Loxia curvirostra*) and white-winged crossbills (*Loxia leucoptera*) have oddly shaped bills, the tips of whose mandibles cross. A bird will stick its bill between the scales of a spruce cone, then open the mandibles, prying apart the scales; the bird lifts out the exposed seed with its tongue. The male red crossbill is brick red in color, and the female is a mix of olive-gray and yellow. The white-winged crossbill has white wingbars in both sexes; the male is a rosy pink, and the female is colored much like the red crossbill female. Both types of crossbills eat the seeds of various conifers, and they also feed on buds and weed seeds. In the years when they winter in Pennsylvania, they may arrive with cold fronts in late October and November.

The common redpoll (*Carduelis flammea*) has a red forehead and a black chin. It is the size of a goldfinch. Redpolls feed actively in brushy and weedy fields and along woods edges, picking up seeds of trees, weeds and grasses. Often they forage in mixed flocks with pine siskins and goldfinches.

The evening grosbeak (*Coccothraustes vespertinus*) is a big, husky bird. The male is dull yellow with prominent white wing patches, and the female is yellowish gray; the massive bill is white in both sexes. Wintering flocks wander widely in search of food, although a feeding station frequently restocked with sunflower seeds will hold them in one area. Evening grosbeaks forage in mixed woodlands, coniferous forests, towns and suburbs. At bird feeders, they often displace one another, as well as the local birds, giving strident chirping calls and putting on aggressive displays while competing for food.



Red Poll



Evening Grosbeaks

Wildlife Notes

Allegheny Woodrat	Opossum
Bats	Otter
Beaver	Owls
Black Bear	Porcupine
Blackbirds, Orioles, Cowbird and Starling	Puddle Ducks
Blue Jay	Raccoon
Bobcat	Rails, Moorhen and Coot
Bobwhite Quail	Raptors
Canada Goose	Ring-necked Pheasant
Chickadees, Nuthatches, Titmouse and Brown Creeper	Ruby-throated Hummingbird
Chimney Swift, Purple Martin and Swallows	Ruffed Grouse
Chipmunk	Shrews
Common Nighthawk and Whip-Poor-Will	Snowshoe Hare
Cottontail Rabbit	Sparrows and Towhee
Coyote	Squirrels
Crows and Ravens	Striped Skunk
Diving Ducks	Tanagers
Doves	Thrushes
Eagles and Ospreys	Vireos
Elk	Vultures
Finches and House Sparrow	Weasels
Fisher	White-tailed Deer
Flycatchers	Wild Turkey
Foxes (Red & Gray)	Woodchuck
Gray Catbird, Northern Mockingbird and Brown Thrasher	Woodcock
Herons	Wood Duck
Kingfisher	Woodpecker
Mallard	Wood Warblers
Mice and Voles	Wrens
Minks & Muskrats	
Northern Cardinal, Grosbeaks, Indigo Bunting and Dickcissel	

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Wildlife Note — 40
LDR0103

Fisher

by Tom Serfass & Denise Mitcheltree

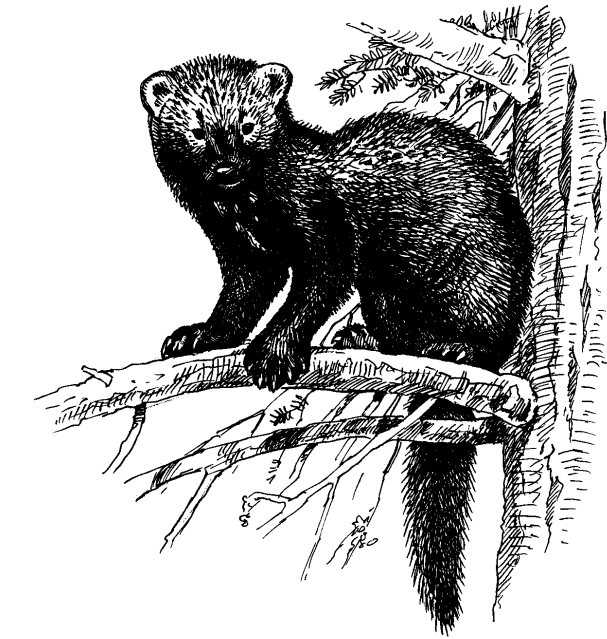
Fishers, *Martes pennanti*, are swift and elegant tree-climbing furbearers. Like the river otter, mink, skunk and pine marten, fishers are members of the Mustelid or weasel family. As with most mustelids, the fisher possesses an elongated body and has relatively short legs. About the size of house cats, adult fishers typically weigh between four and 12 pounds and measure between 30 and 47 inches from the nose to the tip of the tail. In most cases, male fishers are larger than females. In fact, males usually weigh twice as much as females. The heaviest fisher on record was a male trapped in Maine weighing 20 pounds, 2 ounces.

At a distance, the fisher's long fur appears to be a solid glossy black. However, upon close inspection, the tri-colored guard hairs surrounding the face and shoulders give this area of the fisher's body a golden silvery sheen. There is considerable individual variation in the color of a fisher's fur as well as in the shape of white or cream patches of fur that occur on the under-side of the neck, chest and abdomen.

Fishers need continuous forested areas for their survival; they are unlikely to venture into unforested areas. Although conifers have often been described as an essential habitat component, fishers occur in both conifer and mixed forests.

Most people familiar with fishers are aware of their extraordinary ability to climb trees. High above the forest floor, the agile animals locate cavities for denning, rest in abandoned owl and hawk nests, or pursue squirrels, porcupines and other prey. Fishers do travel extensive distances over land, though, and most foraging occurs on the forest floor.

Like many solitary predators, fishers maintain low population densities and a large home range. Home ranges may approach 30 square miles for males and about 12 square miles for females. Female fishers are sexually mature when one year old, while males don't normally



achieve sexual maturity until their second year. Breeding occurs in the spring and the overall gestation period lasts almost a year. Fishers have relatively low reproductive rates, producing one litter a year that averages around two or three cubs, which are born and raised in a tree cavity. Young fishers develop rapidly and are weaned at five to eight weeks, but do not disperse from the natal area and venture out on their own until about six months of age.

Fishers are solitary, opportunistic predators. The name is a misnomer; it does not reflect the animal's food habits. In fact, fishers seldom if ever hunt for fish. When hunting, fishers do not seek out a specific prey item. Instead, they select prey based on abundance and catching ease. Consequently, the diet varies considerably by geographic region. In most parts of the fisher's range, mice, shrews, squirrels, chipmunks and porcupines are important prey items. In northern areas such as Wisconsin and Minnesota, fishers often prey on snowshoe hares and grouse. Food acquired by scavenging also constitutes a significant portion of the fisher's diet. For example, in many areas, gut piles and deer carcasses provide fishers with an abundant late-fall and winter source of food. When available, apples, nuts and other fruits are readily eaten by fishers.

Because of their varied diet and low densities, fishers do not appear to affect most prey populations. Fishers are among the few animals that regularly prey on porcupines, though, and are known to control porcupine populations. In fact, some states have reintroduced fishers for the purpose of reducing porcupine numbers.

Fishers in Pennsylvania

When pioneers began settling here, fishers were widely distributed throughout our forested regions. Unfortunately, the animals were unable to cope with the com-

bined forces of unregulated trapping and timber cutting during the 1800s and, as a result, fishers were essentially eliminated from the commonwealth by the early 1900s.

Declines in fisher populations were not unique to Pennsylvania. Historical records indicate that fishers occurred throughout forested regions of Canada and the northern United States. In the eastern United States, fishers ranged from Maine to North Carolina. Many of these populations also suffered severe declines because of over trapping and destruction of forested habitats.

Because of improved timber and furbearer management, fishers have recovered in other portions of their historic range. In fact, reintroduction projects have restored fisher populations to West Virginia and the Catskill Mountains in southeastern New York. Fishers reintroduced into West Virginia have expanded their range to include forested habitats in western Maryland. Fishers in Maryland have been gradually expanding their range towards Pennsylvania, and during the 1994 trapping season a fisher that presumably dispersed from Maryland was accidentally caught by a trapper in Somerset County in southwestern Pennsylvania.

To date, several fishers have been caught in Somerset County. Fishers from the Catskills also may eventually expand their range to include portions of northeastern Pennsylvania.

Return of large tracts of forested habitat in many areas of Pennsylvania, regulated trapping seasons, and evidence of success in reestablishing fishers in surrounding states suggest that fisher populations can be restored to portions of Pennsylvania. To accomplish this, the Pennsylvania Fisher Reintroduction Project was initiated in 1994 as a cooperative venture between Pennsylvania State University and the Game Commission to restore

this handsome, native component of the state's wildlife community to northcentral Pennsylvania.

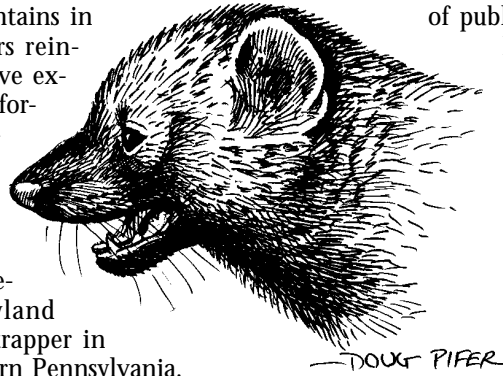
Based on examination of potential fisher habitats, the expansive forested landscape of northcentral Pennsylvania — areas from the Allegheny National Forest to eastern Sullivan County — were identified as potential fisher habitat. In December 1994, the first fishers were released, into the Sproul State Forest in Clinton County. Since that time, and including those in the initial release, about 160 fishers have been reintroduced in the commonwealth. All were obtained from New York and New Hampshire. To assure that adequate forested habitats persist for long-term sustainability of fisher populations, all reintroductions occurred on large tracts

of public lands managed by the Pennsylvania

Bureau of Forestry, Game Commission or Allegheny National Forest.

The foremost purpose of the reintroduction project is to restore a component of Pennsylvania's wildlife heritage. Reintroduction of the fisher will provide outdoor enthusiasts the potential to view one of North America's rarest and most interesting furbearers. Fishers may also serve as an important natural predator of porcupines. Although reintroduced fishers will initially be protected from

harvest, fisher fur is highly esteemed by the fashion industry, and the reintroduction may eventually result in an additional fur resource for Pennsylvania trappers. Because forested habitats are once again plentiful throughout northcentral Pennsylvania, there is a high probability that a fisher reintroduction project can succeed. We hope, with continued wise forest and wildlife management practices, reintroduced fishers will form the nucleus of a population that expands throughout northcentral Pennsylvania and persists for the enjoyment of future generations of Pennsylvanians.



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Wildlife Note — 43
LDR0103

Flycatchers

by Chuck Fergus



Eastern
Wood-Pewee

The tyrant flycatchers — Family Tyrannidae — are found only in the New World. The family name stems from the aggressive, almost tyrannical, behavior of some of the birds in this large group of more than 400 species, most of which live in the tropics. Pennsylvania has ten species. Flycatchers are often hard to identify, even for veteran birdwatchers, because the birds are drab (the sexes are colored alike) and tend to stay among thick foliage. For all practical purposes, they are distinguishable only by their songs. Flycatchers are perching birds, members of Order Passeriformes, whose feet have three toes pointing forward and one toe pointing backward, letting them perch easily on branches.

Flycatchers catch and eat flies and many other insects, particularly flying ants, bees and wasps. In forested areas large flycatchers may specialize in larger insects, medium size flycatchers may take slightly smaller prey, and small flycatchers may zero in on the smallest insects. Such feeding stratification reduces competition and lets several species use the same area. Also, different species prefer subtly different habitats, with varying amounts and densities of undergrowth and degrees of canopy shading.

When foraging, a flycatcher sits upright on a perch, scanning its surroundings while waiting for an insect to approach. The bird darts out in swift, maneuverable flight, snatches an insect out of the air with its beak, and eats it on the spot or returns to the perch to eat the meal. Several adaptations help a flycatcher catch insects. Its drab plumage makes the waiting bird hard to see (not just by its prey, but also by hawks that hunt for flycatchers and other small birds). The bill is flat and wide, suggesting somewhat the bills of swal-

lows and nightjars, although not nearly so compressed or gaping. Bristles at the corner of the mouth may function as “feelers,” letting a flycatcher make last-second adjustments before snapping its bill shut on prey. Keen eyesight lets a flycatcher spot insects and judge distances accurately. In addition to catching insects on the wing, flycatchers sometimes hover near foliage and pick off insects and spiders clinging to the vegetation. Some species land and catch prey on the ground. Most of our flycatchers occasionally eat berries and seeds. Of our ten breeding species, most build open cups anchored to small branches of trees and shrubs. One, the yellow-bellied flycatcher, builds an enclosed nest on the ground. The familiar eastern phoebe plasters its nest against a rock wall or on a building rafter. And the great crested flycatcher uses a tree cavity. In most cases, the female does most or all of the incubating, while the male defends the nesting territory and helps feed the young.

Flycatchers advertise their home territories using their voices; some employ a special “dawn song” given just before sunrise and rarely sung later in the day. Because many flycatchers are so similar in appearance, individuals probably recognize their own species by sound. Biologists believe that in at least several types, the distinctive song is innate, not learned, as is the case with most other birds, which learn to sing by listening to adults of their kind.

As insect eaters, flycatchers must vacate northern breeding areas in winter. They migrate at night. The various species winter in open and forested habitats along the Gulf Coast, on the Caribbean Islands, and in Central and South America. In South America, an estimated 10 percent of all birds belong to the tyrant flycatcher family. In much of their wintering range (which is probably their original or ancestral home, whence populations expanded their breeding ranges eons in the past), flycatchers are vulnerable to habitat loss and fragmentation as large forested tracts are logged or converted to agriculture.

Olive-Sided Flycatcher (*Contopus cooperi*) — Although once fairly common in Pennsylvania, this species may or may not breed in the state today. Its white throat and breast contrast with dark olive sides. A fairly large (seven to eight inches long), big-headed flycatcher, the olive-sided inhabits cool coniferous forests, generally near water. The male sounds a repetitive *pip pip pip*, plus a song that has been rendered as *hic-three-beers*. Individuals sit high in dead snags

or branches, sally forth to catch prey — mainly wasps, winged ants and bees — and return to the perch to eat. Olive-sided flycatchers place their cup-shape nests in trees 40 to 70 feet above the ground, among dense twigs or needles; three young are usual. The main breeding range is in Canada; the species migrates north through Pennsylvania as late as mid-June and leaves again in mid-August, to winter in the rain forests of South America. This long-range migration has earned it the nickname “peregrine of flycatchers.”

Eastern Wood-Pewee (*Contopus virens*) —

The eastern wood-pewee breeds throughout eastern North America from southern Canada to the Gulf of Mexico. It is found in all counties in Pennsylvania. To locate this drab, olive-gray, sparrow-size bird, listen for the male's oft-repeated namesake call — *pee-o-wee* — which is given throughout the day but particularly at dawn and dusk. Pewees use almost every woodland habitat, including woodlots, woods edges, mature forests (both deciduous and mixed), parks, and urban areas with shade trees. They perch in one place for an extended period, flying out to snag passing insects; one study found an average perching height of 35 feet above the ground. Pewees eat flies, beetles, small wasps, and moths. They also consume elderberries, blackberries, and fruits of dogwood and pokeweed.

Males defend breeding territories of two to six acres. Pairs begin nesting in late May. The nest is a compact cup woven of plant matter, hairs and spider silk, its outer surfaces studded with lichens; it looks like a larger version of the ruby-throated hummingbird's nest. The three eggs are incubated by the female and hatch after 12 or 13 days. Both parents feed the young, which make their first flights at 14 to 18 days. Blue jays are major predators, taking both eggs and young. Most perching birds stop singing regularly in late summer, but male wood-pewees keep up their chanting until the autumn migration. The species departs from Penn's Woods in August and September, with a few individuals hanging on until October. Wood-pewees winter in the tropics from Panama to Bolivia, in shrubby woods and along forest edges.

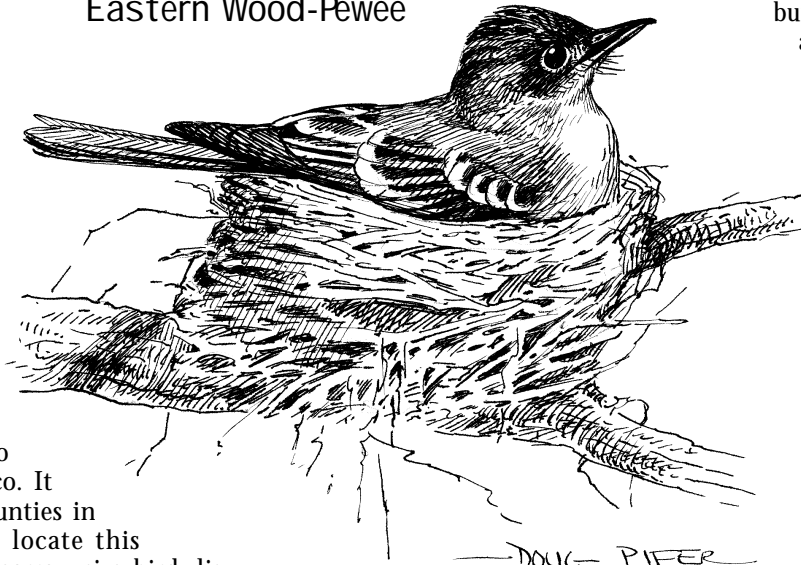
Yellow-Bellied, Acadian, Alder, Willow, and Least Flycatchers (*Empidonax* species) — These small flycatchers (around five inches in length) have olive-colored backs and heads, pale breasts, and pale eye-rings and wingbars. They spend much of the day hunting from a perch. When sit-

ting, they occasionally flip their tails up and down. Extremely difficult to identify in the field, they are usually distinguished by voice and habitat.

The Yellow-Bellied Flycatcher (*Empidonax flaviventris*) lives in the deep shade of coniferous woods and cold bogs. A shy bird and rare in Pennsylvania, it inhabits remote uplands in a scattering of our northern coun-

ties. The call is a quiet, ascending *chu-wee*. The cup-shape nest is built of rootlets and mosses and is hidden on or near the ground, in a cavity among the roots of a fallen tree, in a hummock of sphagnum moss, or at the base of a conifer. The species nests mainly in Canada, as far west as the Yukon Territory, with all individuals apparently migrating through the East.

Eastern Wood-Pewee



The Acadian Flycatcher (*Empidonax virescens*) nests mainly in the Southeast U.S., and Pennsylvania is near

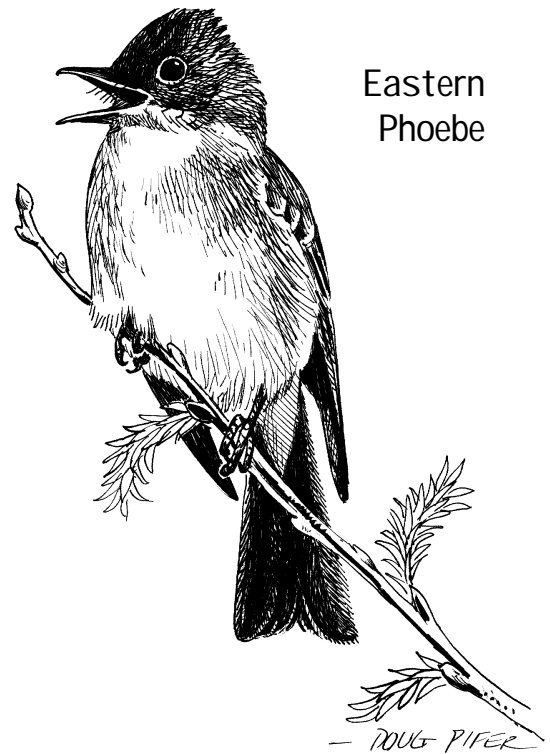
the northern limit of its range. The type, or first, example of the species was discovered near Philadelphia in 1807 by the Scottish-born ornithologist Alexander Wilson. The species is misnamed, since it does not inhabit Acadia, the former French colony centered on Nova Scotia. The Acadian flycatcher lives in moist woods near streams and requires large areas of contiguous forest. The male sounds a low, sharp *spit-chee*!

The Acadian often chooses a beech tree in which to build its frail, hammocklike nest; stems and grasses dangle from the nest, giving it an unkempt appearance. Acadian flycatchers winter mainly in the rain forests of Colombia and Ecuador, where they sometimes follow mass movements of army ants and prey on insects set to flight by the creeping columns.

The Alder Flycatcher (*Empidonax alnorum*) and the **Willow Flycatcher** (*Empidonax traillii*) were, until the 1970s, considered to be one species, Traill's flycatcher (named by John James Audubon for Dr. Thomas Traill, one of his supporters). However, the two types have different voices, use slightly different habitats, build different kinds of nests, and are reproductively isolated. The alder sings *fee-bee-o* and the willow *fitz-bew*; the alder builds a loose cup for a nest, usually within a few feet of the ground, while the willow flycatcher's nest is compact and felled, and often situated higher above ground. Both alder and willow flycatchers nest in thickets of willows, alders and other shrubs, but the willow flycatcher tends to use drier, more-open sites. In Pennsylvania, alder flycatchers nest mainly in the north, while willow flycatchers nest statewide, with the fewest records coming from the northcentral region.

The Least Flycatcher, *Empidonax minimus*, is the smallest of the Eastern Empidonax flycatchers and probably the most common. It lives along woodland edges and often perches in the open. The male calls out an emphatic *chebeck!*, accented on the second syllable. The least flycatcher eats small wasps, winged ants, midges, flies, beetles, caterpillars, grasshoppers, spiders, and berries. The species sometimes nests in loose colonies. The nest, a neat cup, is usually placed in a vertical fork of a branch in a small tree or sapling. The three to five eggs are incubated for 13 to 15 days. The least flycatcher's breeding range stretches from western Canada to Nova Scotia and south in the Appalachians to Tennessee and North Carolina. *Empidonax minimus* is fairly common across much of Pennsylvania, except for the southeast, where it is absent. In autumn, adults migrate ahead of juveniles to wintering grounds in Mexico and Central America.

Eastern Phoebe (*Sayornis phoebe*) — Anyone who has spent time at a woodland cabin has probably come to know this jaunty medium-size (six and a half to seven inches) flycatcher. Phoebes breed statewide in Pennsylvania, except in heavily urbanized areas. They eat a variety of insects, including small wasps, bees, beetles, flies and moths. They often take prey from vegetation and from the ground, and they eat seeds and berries. The female builds a nest out of mud, moss, leaves, grass and hair, tucking



Eastern
Phoebe

Great Crested
Flycatcher

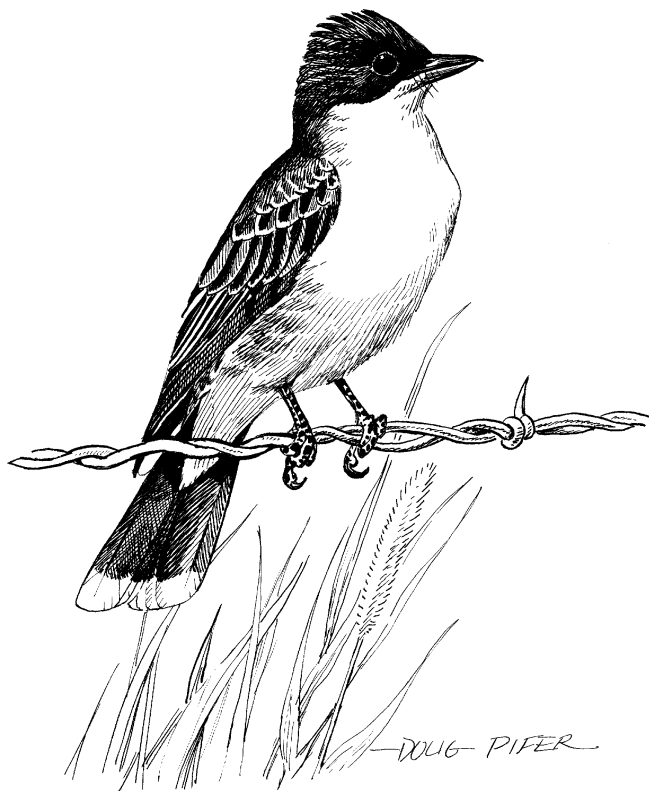


the cup-shape structure into a sheltered spot beneath a rock ledge, against a stone wall, on a bridge beam or barn or porch support. A pair may use the same nest several years in a row.

The female lays four or five eggs and incubates them for around 16 days. Both parents feed the nestlings, which fledge some 16 days after hatching. Eastern phoebes typically rear two broods per summer. One of the harbingers of spring, the first male phoebes arrive around mid-March; they announce themselves with repeated *fee-bee* calls and the species' characteristic up-and-down tail-flicking. In the Northeast, populations have risen since settlement, with phoebes taking advantage of nest sites created by human construction. The species winters in the Gulf states and Mexico.

Great Crested Flycatcher (*Myiarchus crinitus*) — Our largest (eight to nine inches) flycatcher, the great crested sports a yellow belly, a gray breast, and rusty-red tail and wing feathers. When agitated, individuals erect a head crest. The species breeds in mature woods throughout Pennsylvania and eastern North America and can also be found in wooded suburbs, farm woodlots and orchards. Great crested flycatchers feed among the treetops, hopping from limb to limb and snapping up caterpillars, katydids, crickets, beetles and spiders, and by flapping out into openings and clearings to take moths, butterflies, beetles, bees and wasps. In late summer and fall, many wild fruits are eaten.

The call is a loud, insistent *whEEP!* Great crested flycatchers defend their territories against intrusions by squirrels and other birds. They nest in tree cavities, including old woodpecker holes, as well as hollow fenceposts and artificial nesting boxes. (One nest was even found in the barrel of a cannon in Gettysburg National Military Park.) Both male and female bring in grass, weeds,



Eastern Kingbird

Eastern Kingbird (*Tyrannus tyrannus*) — This bold, aggressive flycatcher breeds in open country across North America. Look for kingbirds in scattered trees along roads and streams, orchards, fencerows and forest clearings. The bird gets its name because it dominates other birds, including many larger than itself, driving them away from its territory. Of all the flycatchers, kingbirds are among the easiest to locate and observe. They are about eight inches long and are dark gray and white, with a white-tipped tail and a small red streak on the head. Roger Tory Peterson described the species' call as "a rapid sputter of nervous bickering notes." Kingbirds feed on beetles, wasps, bees, winged ants, grasshoppers, honeybees and many other insects.

Kingbirds often attack crows, hawks and owls, flying high in the air, getting above the larger birds, and diving at them repeatedly. After driving off an adversary, a kingbird may perform a display known as "tumble flight," in which it glides back to the earth in stages, sometimes tumbling in midair. After mating, the female does not let the male help her build the nest and may actually drive him away until after the eggs hatch. The nest is a bulky cup seven to 30 feet-up in a shrub, tree or snag. The two to five eggs hatch after 16 days. Both parents feed the nestlings, which can fly after around 17 days; they may be fed by their parents for a month after fledging, with family members sounding rapid *kitterkitter* calls back and forth. Kingbirds have a very different lifestyle on their wintering range in South America, where they coexist in flocks and switch to a diet of berries.

bark strips, rootlets, and feathers, often building up this cushion as high as the entry hole. They have the curious habit of placing a shed snakeskin or scrap of cellophane among the nest material; some ornithologists speculate that the crinkly foreign matter may deter nest predators. Great crested flycatchers depart from Pennsylvania in September en route to wintering grounds in southern Florida and from Mexico to Colombia.

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Wildlife Note — 5
LDR0103

Red and Gray Foxes

by Chuck Fergus

Red and gray foxes are small, agile carnivores belonging to the same family (Canidae) as the dog, coyote and wolf. Both red and gray foxes are found throughout Pennsylvania. They are intelligent predators with extremely sharp senses of sight, smell and hearing (A fox can hear a mouse squeal at about 150 feet).

Biology

The red fox (*Vulpes vulpes*) is 22 to 25 inches in length, with an additional 14- to 16-inch tail, and weighs 8 to 12 pounds. The gray fox (*Urocyon cinereoargenteus*) is 21 to 29 inches in length, plus an 11- to 16-inch tail, and weighs 7 to 13 pounds. Foxes look like they are heavier than these weights, an impression created by their full, thick fur.

The red has long, reddish-orange fur slightly darkened on the back; black ears, legs and feet; and a long, bushy, white-tipped tail. The gray fox has a grizzled gray coat, somewhat coarser than the red's, with buff-colored underfur. The gray's tail is also long and bushy, with a black streak running down its length and a black tip.

Dramatic color variations may occur in individual reds, although these are rare and show up more often in the species' northern range, especially in Canada. These color variations include: the "cross fox," with a dark stripe of hair extending from the head down the center of the back and transected by another dark stripe over the shoulders, thus forming a cross-like shape; the "black fox," a melanistic red fox;

and the "silver fox," simply a black individual with white-tipped guard hairs giving a frosted appearance. The red fox always has a white tail tip, no matter the color phase or shade of red fur (which also varies slightly in individual animals).

Foxes are swift runners and can swim if they have to. Both reds and grays are mainly nocturnal. The gray can climb trees — it is the only member of the canine family with this ability.

Foxes are "opportunists" when it comes to feeding. This means they will eat whatever is most easily obtained. Foods include mice, rats, rabbits, woodchucks, opossums, porcupines, domestic cats, chickens, insects, squirrels, game birds, songbirds, bird eggs, fruits and grasses.

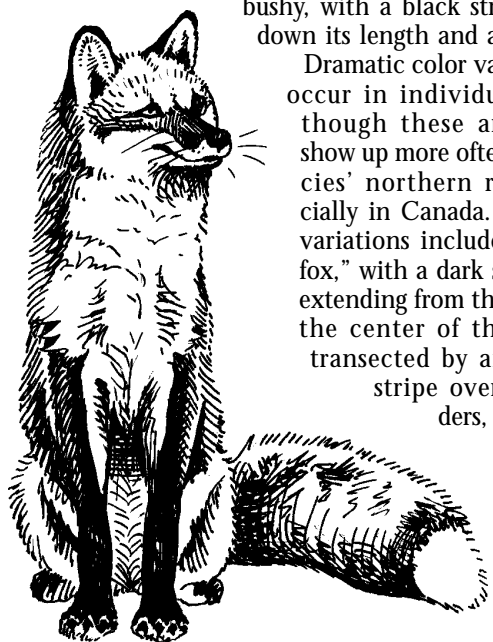
Foxes are also scavengers, feeding on roadkilled animals and winter kills. Diets of both reds and grays are essentially the same, but different food preferences, behavior patterns and preferred habitat often result in different types and amounts of food eaten. Both species cache uneaten food by burying it in loose earth.

Males are called "dog" foxes and females "vixens." In late winter, foxes can be heard barking at night, making their presence known to members of the opposite sex. Breeding usually takes place in February.

Young are born following a 51-day gestation period for red foxes and a 63-day period for grays. Litters range from 4 to 10 young, with 6 the average. Young are born in dens. The red fox usually enlarges a woodchuck burrow or may den in a hollow log; the gray may also den beneath the ground or in crevices in rocky ledges. Underground dens for both species usually have several entrances.

Fox pups weigh about eight ounces at birth, and their eyes are closed for the first 8 to 10 days. They are nursed by the female in the den for around a month. When the pups emerge, both mother and father keep them supplied with solid food until they are completely weaned after two or three months.

They leave the den area in mid-July or August and may forage with their parents for another month until the family disbands. Foxes trapped in the fall are often young ones, on their own for the first time and establishing new territories. Both males and females are sexually



mature at 10 months and may breed during their first winter.

Red foxes seldom seek shelter in holes or dens during winter, preferring to sleep in the open with their bushy, well-insulated tails curled over their noses to keep them warm. Grays often hole up for three or four days at a time during severe weather.

Foxes may be afflicted with many parasites, including ticks, fleas, lice, mites, flukes and worms. Reds seem to be more susceptible to mange than gray foxes. Both species can contract rabies. Diseases and parasites strike foxes the hardest when they overpopulate an area; this is nature's way of managing an excessive population.

Wildlife researchers have live-trapped foxes, tagged and released them. These studies have shown that foxes, especially young adults, are susceptible to many limiting factors, including trapping, hunting, highway mortality and coyote predation. A life span of 10 to 12 years is possible, however.

Habitat

Red and gray foxes generally favor different types of habitat. The red prefers sparsely settled, rolling farm areas with wooded tracts, marshes and streams. The gray fox is more commonly found in brushy areas, swampy lands and rugged, mountainous terrain. But both species are very adaptable and can be found throughout the state, sometimes in areas not considered prime habitat.

Red foxes seem less bothered by people than grays and often inhabit heavily populated areas, although they are rarely seen due to their nocturnal habits. There are countless stories of reds rearing young in suburban settings. Generally, if the area can provide food and shelter, foxes will consider it, especially since coyotes continue to push out, or displace, reds from their historic haunts.

Grays are usually more aggressive than reds and where the ranges of the two overlap, the gray is typically the dominant species. But there are exceptions to every broad statement made about wildlife. Knowing that, you can figure somewhere out there are places where reds rule or where the two species coexist without problem.

Population

Fox populations are affected by availability of food, habitat suitability, coyote predation and hunting and trapping pressure. Pennsylvania studies have documented that some high-use agricultural areas — with little cover for either prey or predators — had only one fox per 300 acres, or 2.1 foxes per square mile. Wooded and less heavily farmed areas had one fox per 50 acres or 12.8 per square mile, a high concentration.

Fox populations can be measured by different methods, including counting droppings on the snow, den re-

connaissance and tracking studies. The gray fox has much larger toe pads and a smaller foot than the red, so the two can often be distinguished by their tracks.

Movements in gray and red fox populations are basically of two types. The first is dispersal, or the movement of young in late summer or early fall. Dispersal spreads the population out, with each young fox moving several miles — occasionally 50 miles or more — to set up its own home territory. The second type of movement is displacement, which is caused by habitat changes and predation. There are also localized movements, the travels of individual within their home territory or range. From tracking studies, biologists estimate that a fox travels an average of five miles in search of food on a winter night.

Populations fluctuate and shift, often as a result of human activities such as logging, farming, construction and hunting. Disease also plays a role. In areas where mange outbreaks occur, red fox populations are often severely impacted. But foxes are very resilient. Both species seem to readily rebound from disease and other limiting factors, so long as the area they inhabit can provide food, escape cover and safe havens.

Proof of the resiliency of foxes was their ability to weather decades upon decades of persecution through bounties in Pennsylvania. Abolished in 1966, bounties were a fee paid to people for each fox they killed. Bounties were discontinued because it was determined the monies used to pay them were better spent on habitat enhancements.

Foxes are often blamed for decreasing game populations, but most of the time the number of game animals taken by foxes and other predators is insignificant compared to other natural losses. When all facts are considered, habitat change is most often found to be the main contributor to lower small game populations. It's true that foxes take grouse, pheasants, rabbits and other game, but these are usually "surplus" individuals, those animals that would likely die from other causes — accidents, disease, starvation, etc. — before the next breeding season.

More and more people are accepting predators as valuable members of our natural world. Foxes are no exception. Their presence in Pennsylvania provides recreation and wildlife diversity, two important facets of any wildlife management program.



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Wildlife Note — 51
LDR0103

Gray Catbird, Northern Mockingbird and Brown Thrasher

by Chuck Fergus

These three species are among the most vocal of our birds. All belong to Family Mimidae, the “mimic thrushes,” or “mimids,” and they often imitate the calls of other species, stringing these remembered vocalizations into long, variable songs. Family Mimidae has more than 30 species, which are found only in the New World, with most inhabiting the tropics. The mimids have long tails and short, rounded wings. The three species in the Northeast are solitary (living singly, in pairs and in family groups rather than in flocks), feed mainly on the ground and in shrubs, and generally eat insects in summer and fruits in winter. The sexes look alike. Adults are preyed upon by owls, hawks, foxes and house cats, and their nests may be raided by snakes, blue jays, crows, grackles, raccoons, opossums and squirrels.

Gray Catbird (*Dumetella carolinensis*) — The gray catbird is eight to nine inches long, smaller and more slender than a robin, an overall dark gray with a black cap and chestnut around the vent. Individuals often jerk their tails — up, down, and in circles. The species is named for its mewling call, although catbirds also deliver other sounds. They migrate between breeding grounds in the eastern two-thirds of North America and wintering areas in the coastal Southeast and Central America. Gray catbirds are abundant and statewide in Pennsylvania, inhabiting hedgerows, woods undergrowth, regenerating cut-over land, shrubby areas near water, woods edges and suburban plantings. They shun dense forests.

Catbirds eat wild fruits and insects. In summer the diet is around 60 percent fruit, and in spring, 20 percent fruit.

Gray Catbird



Beetles, ants, caterpillars, grasshoppers, crickets and other insects are common foodstuffs. Catbirds often forage on the ground, using their bills to flick aside leaves and twigs while searching for insects.

Although not as talkative as the northern mockingbird, the catbird is still a versatile vocalizer. Its ability comes in part from the structure of its syrinx, or voice box, whose two sides operate independently, letting the bird sing with two voices at the same time. A catbird calls out a rapid string of syllables — more than 100 types in some individuals — including squeaks, chitters, whistles, whines and songs swiped from other birds. The

babble, which lasts up to 10 minutes, is frequently punctuated by the familiar catlike mewl.

Catbirds are monogamous. They nest from May into July and usually raise two broods per year. The nest, substantial and deeply cupped, is placed in a dense thicket, briar patch, vine tangle, or shrubby tree, three to nine feet above the ground. The female lays three to five eggs, which are a dark greenish blue and unmarked. Brown-headed cowbirds often lay their eggs in catbird nests, but catbirds almost always recognize the parasitic eggs (which are pale and dotted with brown) and pitch them out of the nest. Catbirds destroy eggs and nestlings of other species, including wood-pewees, robins and sparrows; biologists don't know whether this behavior represents an attack on competitors or a feeding strategy. Parents feed their own young mainly on insects and spiders. Incubation takes two weeks, and the young leave the nest 10 or 11 days after hatching.

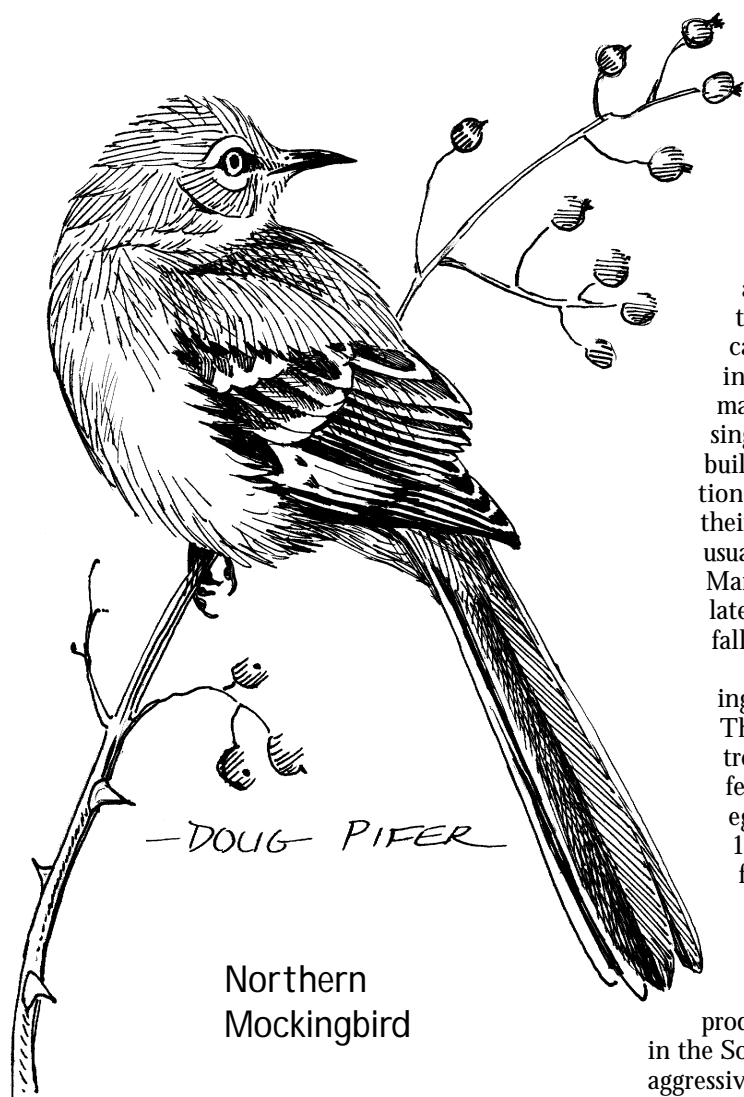
Northern Mockingbird (*Mimus polyglottos*) — The slender, robin-size northern mockingbird has a gray back, a pale breast and conspicuous white patches on the tail and wings; when foraging, a mockingbird will often stop and flick

its wings, opening them to expose the white patches. The species lives year-round on its range, which overlays most of the lower 48 states and includes southern Canada, the Caribbean islands and Mexico. Mockingbirds live in towns and cities, where they often forage on lawns and in thickets, road margins, woods edges, cut-over lands and farms. They like a mix of low shrubs and open terrain. In Pennsylvania mockingbirds are most common in the southeast, the southcentral (although not in the mountains) and the southwestern regions.

About half of the diet consists of insects and half of native and cultivated fruits. When hunting for insects, a mockingbird will run along on the ground in short grass, stopping and lunging for its prey: beetles, ants, bees, wasps, grasshoppers and others. Mockingbirds also eat spiders, earthworms, snails and sowbugs. In fall and winter berries and fruits make up most of the diet, including grapes, apples, barberries, hawthorn, elderberries and (a particular favorite) multiflora rose hips. Mockingbirds sometimes drive off cedar waxwings and other birds, with whom they compete for fruit. In winter mockingbirds may visit feeding stations for seeds and suet, pugnaciously chasing other birds away.

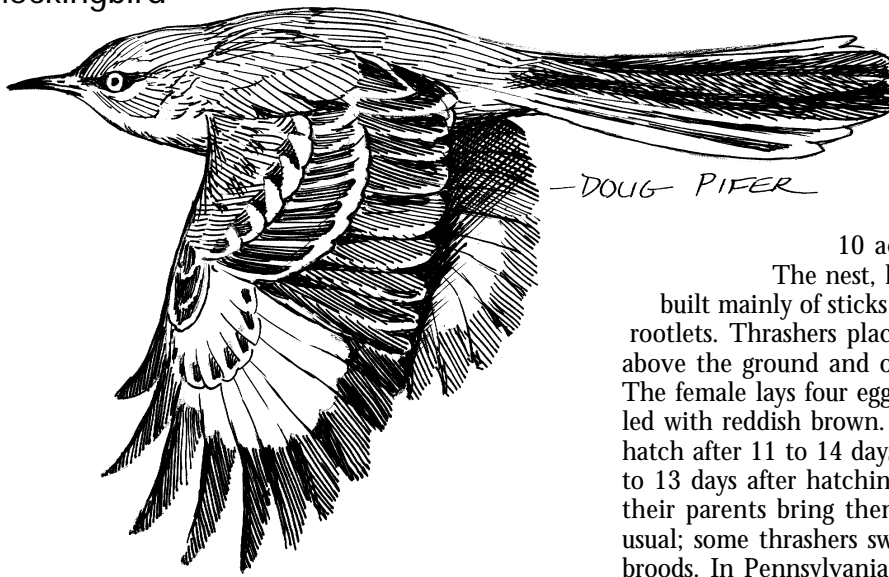
Both male and female mockingbirds sing, but the males are the true virtuosos. They mimic snatches of other birds' songs, calls of crickets and frogs, dogs barking and even mechanical noises such as squeaky hinges and squealing tires. A male's repertoire increases as the bird ages and may ultimately include more than 150 distinct song types. Usually an individual repeats one sound or song three to six or more times, then switches to another song, and so on, singing for minutes on end. (Brown thrashers usually repeat each song once, while catbirds do not repeat.) In the spring, male mockingbirds sing to establish territories and attract mates, starting around an hour before sunrise. They sing in flight, on the ground, from perches, when building nest foundations, during and after copulation, while foraging — even with food clutched in their bills. Unmated males may sing during the night, usually from a hidden perch. Mockingbirds sing from March to August (the breeding season) and from late September into November (while establishing fall and winter feeding territories).

Mockingbirds are mainly monogamous. Courting males and females chase each other in flight. The nest is a bulky cup built in a dense shrub or a tree, usually 3 to 10 feet above the ground. The female lays three or four greenish to bluish gray eggs, blotched with brown. She incubates them 12 to 13 days. Both sexes feed the young, which fledge after 12 days, although they're not strong fliers for another week. At fledging, the male may continue to feed the young while the female lays and begins incubating the next clutch. This division of labor lets mockingbirds produce two and sometimes three broods (up to four in the South) during each breeding season. Mockingbirds aggressively defend their nests, driving away predators and attacking humans who venture too close.



Northern
Mockingbird

Northern Mockingbird



Some mockingbirds spend the whole year as a pair on a single territory, while others, particularly in the northern part of the range, use different breeding and wintering territories. In the north, some individuals may migrate south in winter. Young disperse up to 200 miles from where they hatched. Ornithologists believe the spread of multiflora rose (an invasive species once planted widely for wildlife habitat) and the planting of ornamental shrubs (especially *Pyracantha*, or firethorn) provided key winter food and shelter, aiding the mockingbird in a northward population expansion that has gone on for close to a century.

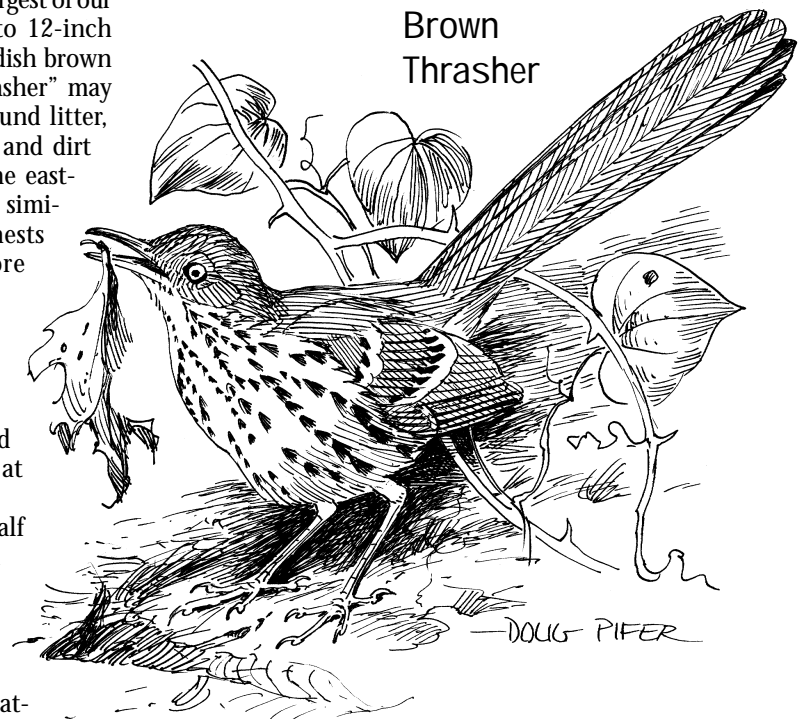
Brown Thrasher (*Toxostoma rufum*) — The largest of our three mimics, the brown thrasher has an 11- to 12-inch length, half of which is tail. Plumage is rich reddish brown above, heavily streaked below. The name "thrasher" may come from the bird's habit of thrashing the ground litter, using its long, curved bill to sling aside leaves and dirt while foraging. Brown thrashers breed across the eastern two-thirds of North America, with a range similar to that of the gray catbird. The species nests statewide in Pennsylvania, although it's more common in the southern than the northern counties. Brown thrashers prefer brushy, thorny places, including hedgerows, thickets, forest margins and clearings and old fields overgrown with shrubs. Shyer than catbirds and mockingbirds, they are less likely to live around people, and they often flee into escape cover at the sight of a human.

Brown thrashers feed on insects (more than half the annual diet), berries, small fruits, seeds and nuts, including many acorns. Occasionally they take crayfish, lizards and small frogs. The best time to observe brown thrashers is in April, before nest building has commenced, when males sing from high, exposed perches to at-

tract mates. The song is full of improvisation and mimicry of other species, including flickers, titmice, cardinals and thrushes; observers have reported more than 3,000 song types, the largest repertoire of any North American bird species. The alarm call is a crackling note that may sound like a loud, smacking kiss. After mating, males continue to sing but in a quieter tone. Territories are 2 to 10 acres.

The nest, hidden in dense, tangled cover, is built mainly of sticks and twigs and lined with cleaned rootlets. Thrashers place their nests from 1½ to 20 feet above the ground and occasionally on the ground itself. The female lays four eggs, which are pale blue and freckled with reddish brown. Both parents incubate. The eggs hatch after 11 to 14 days, and the young leave the nest 9 to 13 days after hatching. They stay in the vicinity, and their parents bring them food. Two broods per year are usual; some thrashers switch mates between same-season broods. In Pennsylvania, nesting runs from early May to the end of July.

Brown thrashers in southern areas are permanent residents, but most of those breeding in the Northeast leave the region in September and October and take up residence in thickets in the Gulf states. Statewide, the brown thrasher population seems to have decreased by about four percent a year since the mid-1960s, perhaps because of cowbird parasitism, nest predation and the growth of old fields into mature woodlands.



Wildlife Notes

Allegheny Woodrat	Opossum
Bats	Otter
Beaver	Owls
Black Bear	Porcupine
Blackbirds, Orioles, Cowbird and Starling	Puddle Ducks
Blue Jay	Raccoon
Bobcat	Rails, Moorhen and Coot
Bobwhite Quail	Raptors
Canada Goose	Ring-necked Pheasant
Chickadees, Nuthatches, Titmouse and Brown Creeper	Ruby-throated Hummingbird
Chimney Swift, Purple Martin and Swallows	Ruffed Grouse
Chipmunk	Shrews
Common Nighthawk and Whip-Poor-Will	Snowshoe Hare
Cottontail Rabbit	Sparrows and Towhee
Coyote	Squirrels
Crows and Ravens	Striped Skunk
Diving Ducks	Tanagers
Doves	Thrushes
Eagles and Ospreys	Vireos
Elk	Vultures
Finches and House Sparrow	Weasels
Fisher	White-tailed Deer
Flycatchers	Wild Turkey
Foxes (Red & Gray)	Woodchuck
Gray Catbird, Northern Mockingbird and Brown Thrasher	Woodcock
Hérons	Wood Duck
Kingfisher	Woodpecker
Mallard	Wood Warblers
Mice and Voles	Wrens
Minks & Muskrats	
Northern Cardinal, Grosbeaks, Indigo Bunting and Dickcissel	

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Wildlife Note — 16
LDR0603

Heron Family

by Chuck Fergus

Have you ever hiked along the edge of a quiet stream or marsh and startled a big, long-legged bird that flapped slowly out of the water, leaving only a widening ripple? Chances are good that the bird was a heron.

There are about 60 species of herons distributed over most of the world, except in the extreme northern and southern regions. Herons are most common in the tropics. Herons, bitterns and egrets are closely related, belonging to the family Ardeidae of the order Ciconiiformes. Other close avian relatives include storks, ibises, spoonbills and flamingos.

Hérons are wading birds with long, slender legs, long necks and long, heavy bills tapering to a sharp point. Their wings are broad and rounded, their tails short. Most herons, especially the larger ones, are graceful in form and movement.

Hérons are predators, feeding on animal life (fish, frogs, crayfish, snakes, insects, invertebrates and small rodents) found in shallow water and along the shoreline. Herons swallow food whole and later regurgitate pellets of indigestible matter. They inhabit both freshwater and saltwater areas. In Pennsylvania, they're found on lakes, reservoirs, ponds, rivers, woods streams, bogs, marshes and swamps, where they typically stand at the water's edge or walk slowly through the shallows. They may also perch in trees near or over water.

Hérons are shy birds. When approached by humans, they usually take off in slow flight, with head and neck drawn back in an S-shape and legs held straight to the rear. Most herons are strong fliers, propelling themselves with deep, pumping wing strokes.

Certain adaptations help a heron wade about and catch prey in shallow water. The most obvious is its legs, which elevate the bird above the water surface. The toes are long and flexible for walking or standing on soft ground. The bill is sharp-tipped, but it's used for grasping, not impaling. The long, muscular neck delivers a lightning-quick blow, with plenty of force to penetrate the water and seize a fish.

Hérons have well developed "powder down," areas of feathers with tips that continually disintegrate into powder. Preening helps distribute this powder, which absorbs and removes fish oil, scum and slime, thus keeping the

rest of the plumage clean and dry. Herons preen with a serrated middle claw.

Males are aggressive and defend small territories in breeding season. They fight (although rarely causing physical damage); sound harsh calls; go through elaborate, instinctive motions such as raising their wings, stretching their necks, fluffing their feathers, or erecting their crests. Some also put on spectacular flight routines. In most species, bright colors appear on the bill, legs or in the bare skin around the eyes.

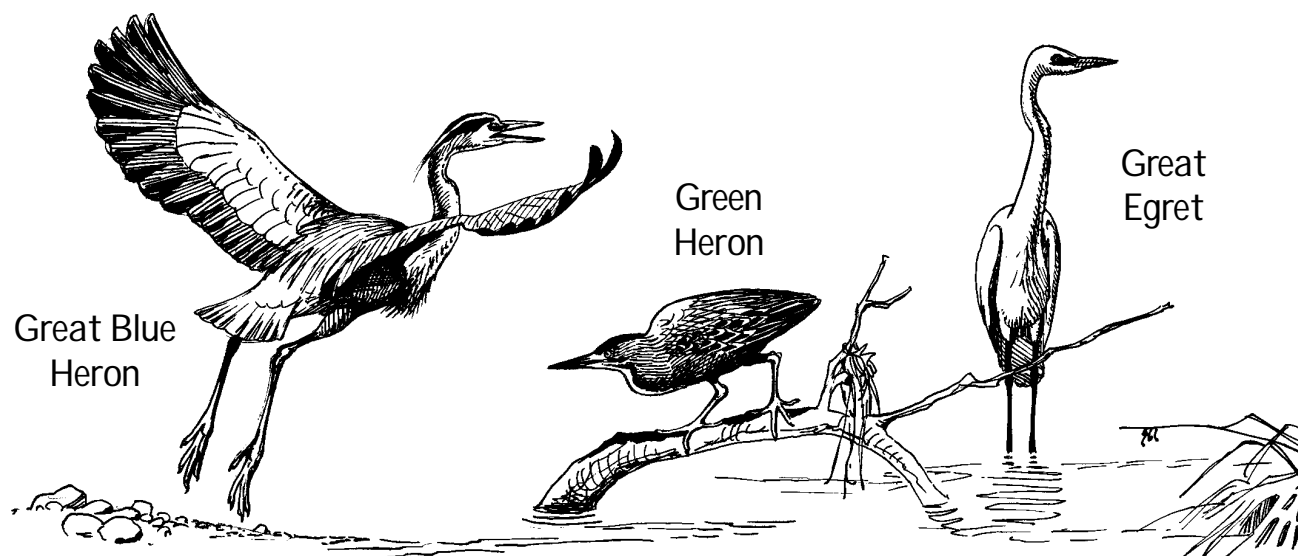
Often the male begins building a nest to attract a mate; then the female takes over construction and the male brings sticks and twigs. Mated herons defend a zone immediately around their nest against intrusion of other birds. Some species nest in colonies (sometimes called heron rookeries), while others are solitary nesters. Herons may nest in mixed colonies (great blue, black- and yellow-crowned night herons building nests in the same grove of trees). Or, in certain parts of their range, they may nest with cormorants, pelicans and ibises.

After breeding, 3 to 6 unmarked bluish, greenish, or brownish eggs are laid in a nest of sticks in a tree (herons and egrets) or a nest of grasses on the ground (bitterns). The eggs are incubated by both parents for 2½ to 4 weeks, depending on the species. Some herons begin incubating immediately after the first egg is laid, so that young hatch at intervals and differ in size. Young remain in the nest 2 to 3 weeks.

At first, parents regurgitate pre-digested liquid food to their nestlings. Later, they bring partly digested food, and finally whole fish, frogs, snakes and other items. A growing heron or bittern will grasp the base of its parent's bill in a scissors-grip and wrestle with it. This triggers an impulse in the adult either to drop or regurgitate the food.

The following herons and allies, which breed in Pennsylvania, are covered in this Wildlife Note: great blue heron, green-backed heron, great egret, black-crowned night heron, yellow-crowned night heron, least bittern and American bittern. All are migratory, generally breeding in northern areas and migrating south in autumn. Some species migrate in flocks, some in small bands, and some individually.

Other herons occasionally visit Pennsylvania. The



little blue heron is a migrant occasionally spotted in April, and later in July and August. Little blues are 22 inches in length, with brownish heads and bluish-gray bodies. The cattle egret was first observed in Pennsylvania in 1956 and is now common in some areas; its plumage is white, with brownish plumes on the back, lower breast and crown, and a reddish bill and legs. The snowy egret (white, with black legs and bright yellow feet) is seen in spring and late summer. These four species typically breed farther south or along the Atlantic coast. Snowy and cattle egrets nested in Pennsylvania during the 1970s and '80s. Their colony on the Susquehanna River's Rookery Island in Lancaster County was abandoned in 1988.

Wading birds are part of the complex web of life in the marshes and along the water's edge. When several species of herons inhabit a waterway, lake or swamp, specialized feeding patterns often develop. The great blue heron usually wades in deeper water, looking for large fish. Common egrets hunt the slightly smaller fish found closer to shore. The green-backed heron waits motionless for its prey near a log or bank; bitterns snatch frogs and tadpoles among the reeds. On dry ground, cattle egrets forage for grasshoppers and other insects stirred up by livestock, while the black- and yellow-crowned night herons patrol shallow waters in the late evening and at night.

Although mainly predators, herons are also prey for some species, including foxes, minks, hawks and especially raccoons. Crows and tree-climbing snakes may rob ungarded nests. Few predators dare tackle an adult heron, especially one of the larger species.

At one time herons were slaughtered for their plumage, which was used to decorate women's hats, but today they have little to fear from humans. They're protected by federal and state laws. However, herons are affected by loss of habitat, especially when marshy or coastal areas are developed.

Hérons, and many other species of wildlife, benefit from Pennsylvania Game Commission waterfowl projects

and habitat preservation and enhancement work on State Game Lands. Areas such as Pymatuning, Middle Creek and Shohola provide many acres of excellent marshland habitat. In propagation areas (where human visitors are not permitted to intrude), herons have ample isolated territory in which to breed and raise young.

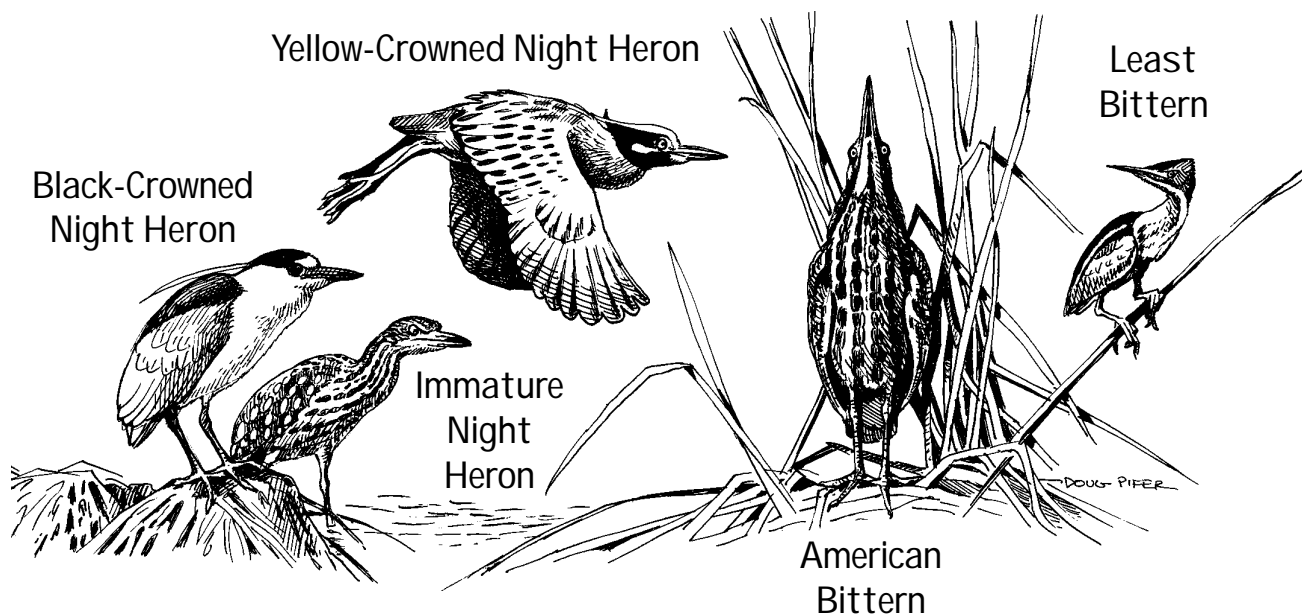
Great Blue Heron (*Ardea herodias*) — This bird probably comes to mind most when the word "heron" is mentioned. It's the largest of the dark herons, 38 inches long (as seen in the field) with a 70-inch wingspread. A great blue heron's head is largely white (with a feathery black crest), the underparts are dark gray, and the back and wings are grayish-blue. The legs are dark.

When hunting, a great blue walks slowly through the shallows or stands in wait, head hunched on its shoulders. Favorite foods include fish (up to a foot in length), water snakes, frogs, crayfish, mice, shrews and insects. Individuals are believed solitary except in breeding season. Call: three or four hoarse *squawks*.

Great blue herons inhabit saltwater or freshwater areas near trees suitable for nesting — the more remote and inaccessible, the better. They nest singly, in colonies and among the nests of other herons, often in the same tree. The nest is a platform of large sticks lined with fine twigs and leaves and built in a sturdy crotch or on a limb. Its outside diameter is 25 to 40 inches. The male brings nesting material to the female, which does most of the actual building. Nests may be used several years.

The female lays 3 to 6 (usually four) pale bluish-green, unmarked eggs. Incubation is by both sexes and takes 28 days. Both parents feed the young, which are ready to leave the nest in three weeks.

In spring, the great blue heron is a common migrant in March and April; in summer, a breeding resident, with the greatest concentrations of nests occurring in the northwestern counties. The species generally breeds across the northern United States, southern Canada and Alaska. In the fall, great blue herons pass through our state from July to October. Some remain as winter resi-



dents, hanging out along waterways and other open water. The species winters principally along the Atlantic coast, the southern states and Central and South America.

Green-Backed Heron (*Butorides striatus*) — This small heron is found in ponds and along wooded streams. Its length is 14 inches, its wingspread 25 inches. The bluish-green back and wings give the bird its name; underparts are dark, while the neck and head are reddish-brown and the crown is black. This bird may appear all dark from a distance, especially on a cloudy day. Immatures resemble American bitterns.

A green-backed heron flies with deep wingbeats. Its call is a sharp, descending kew. The green-backed heron feeds on fish, frogs, insects, worms, lizards and salamanders, hunting early in the morning and late in the afternoon.

Green-backed herons usually nest in shrubs or trees overhanging the water, but sometimes in orchards and groves away from any water source. A pair may nest by itself or in a loose colony of other herons (the green is not as gregarious as the great blue). The nest is a platform of twigs and sticks lined with finer material; some nests are so shallow and flimsy that the eggs can be seen through the bottom. The male selects the nesting site and starts building, and the female finishes the task. Outside nest diameter is 10 to 12 inches. Four to six oval, pale blue or green unmarked eggs are laid, which both sexes incubate for 20 days. Some pairs raise two broods.

In spring, green-backed herons are common April-May migrants. In summer, they are breeding residents (the species breeds throughout the eastern United States, Central America and in Arizona and Texas); in fall, they're common July to September migrants, with stragglers into November. Green-backed herons rarely winter as far north as Pennsylvania.

Great Egret (*Casmerodius albus*) — The great egret — also called the common or American egret — was nearly gone from the United States by the early twentieth century. For years the birds had been killed for their long,

white body plumes, used to feather women's hats. Strong conservation laws saved the species, which is repopulating its former range.

A great egret's plumage is pure white, the bill yellow, and the legs and feet glossy black. It's the largest white heron likely to be observed in Pennsylvania, with a 32-inch length (not counting tail plumes), a 55-inch wingspread, and a standing height of about two feet. Preferred foods are fish, small mammals, amphibians, and insects.

Egrets inhabit swamps, brushy lake borders, ponds, Susquehanna River shallows, islands and mudflats. Nests are in colonies, sometimes with other heron species, usually 10 to 50 feet up in trees. In forests with large trees — beech and red maples are favorites — egret nests may be 80 feet in the air, along with the nests of great blue herons. Nests are made of sticks and twigs, two feet in diameter, sometimes lined with leaves, moss and grass. Eggs: 3 to 4 oval, blue or greenish-blue, unmarked. Incubation is performed by both sexes and takes 23 to 24 days.

Breeding resident egrets arrive in April. Post-breeding dispersal occurs from July to October. Migrants also pass through the state at this time. Egrets are rare winter residents, sometimes staying on the John Heinz National Wildlife Refuge at Tinicum in Delaware and Philadelphia counties.

Black-Crowned Night Heron (*Nycticorax nycticorax*) — Night herons have heavy bodies and short, thick necks. A species of special concern in Pennsylvania, this bird is 20 inches in length, with a 44-inch wingspread. Adults have glossy greenish-black backs, pale gray or white undersides, and yellow-orange legs; three white, 6-inch plumes extend back from the black crown. Immatures are heavily streaked with brown and lack the red eye of the adult.

In flight, black-crowned night herons resemble slow, light-colored crows. They fly in loose flocks and often roost communally. Usually inactive during the day, they hunt at night. Food: mainly fish, some eaten as carrion; also dragonflies, other insects, crayfish, worms and small

rodents. Call is a single *kwawk*, most often given at night.

These herons adapt to extremely varied habitat: fresh, salt and brackish waters, forests, thickets and even city parks. They nest close together in small to large colonies — sometimes with other species — in trees, shrubs or on the ground in cattail stands. Nests are built of sticks, twigs or reeds, and sometimes are lined with finer material. Both sexes build (construction takes 2 to 5 days). Females lay 3 to 5 pale blue or green unmarked eggs, which hatch in 24 to 26 days.

In spring, black-crowned night herons occupy nest colonies in April. In summer, they are breeding residents (rare in central and northern Pennsylvania, but fairly common in the southern counties). Fall: August and September migrants. Winter: residents in the southeast and other southern counties. Most individuals, however, go farther south.

Yellow-Crowned Night Heron (*Nyctanassa violacea*) — A endangered species in Pennsylvania, this bird is similar in size and body configuration to the closely related black-crowned night heron, except that the yellow-crowned has slightly longer legs (standing height about 1½ feet). It has a yellow patch on its head, a gray body, and a black and white face. The call, a strident *kwawk*, is slightly higher-pitched than that of the black-crowned.

Yellow-crowned night herons hunt mainly at night but also at times during the day. They eat frogs, fish, salamanders, lizards and insects. Catching crayfish is their specialty. They nest singly and in small colonies, sometimes with other herons. The stick nest is built in a tree or shrub and sometimes lined with fine twigs, rootlets or leaves. Both sexes build, or they may re-use an old nest. This species is more secretive in its nesting habits than other herons, with the exception of bitterns. Eggs: 3 to 4 smooth, pale bluish-green, unmarked. Incubation is by both sexes.

In spring, yellow-crowned night herons migrate through our state in April and early May. In summer, they are breeding residents in the southeastern area: most nesting is concentrated in Cumberland, Lancaster and Montgomery counties. In fall, they are rare August to October migrants; and they winter principally in the southern United States and Central and South America.

Least Bittern (*Ixobrychus exilis*) — The least bittern, the smallest of our herons and a threatened species in Pennsylvania, is 11 to 14 inches long with a 17-inch wingspread. It has large buffy wing patches; a black crown, tail and back; and yellow legs. This shy bird is not often observed, partly because it usually hides in tall grasses and sedges at the hint of trouble, but mostly because the bird is predominantly nocturnal. A weak flier, the least bittern would rather run from danger or “freeze” by standing motionless with its long, tapered bill pointed upward (thus blending into the marsh background like a stick or reed). Food: insects, salamanders, fish, frogs and tadpoles. Their call is three or four low, soft *coos*.

Least bitterns regularly breed in emergent and brushy wetlands in the glaciated wetlands of northwestern counties and at Presque Isle. The species nests elsewhere, but

irregularly, wherever suitable habitat exists.

The species nests on the ground in marshes, bogs or brackish water areas. Nests are 6- to 10-inch wide platforms of dead plant material interwoven with living plants, often built in thick cattails, tall grass or under bushes 1 to 8 feet from the water. The female lays 4 to 5 pale bluish-green, unmarked eggs. During incubation (17 to 20 days), adults do not fly directly to their nest: they land nearby and approach quietly through the ground cover.

Least bitterns are rare April to May spring migrants. In summer, they're rare breeding residents (the species breeds throughout the East and in parts of the western United States). In fall, they are rare August to September migrants. They winter principally in Florida, Texas and Central America.

American Bittern (*Botaurus lentiginosus*) — The American bittern is 23 to 24 inches long, has a 45-inch wingspread, and a 1½-foot standing height. Plumage is dappled dark and light brown, with a black streak on each side of the upper neck, and yellow legs. In flight, which is slow and deliberate, the black flight feathers are distinctive.

This shy, elusive bird, inhabits the tall vegetation of freshwater marshes. Most active at dusk and at night, it preys on mice, snakes, lizards, salamanders, frogs, insects, etc. An individual hunts by standing motionless and waiting for prey to pass. Like the least bittern, the American bittern hides by freezing with its bill pointed up. On breeding grounds, it makes a hollow croaking or pumping sound, *oonck-a-tsoonck*, from which it earned the colloquial name “thunder pumper.” It can be heard for up to a mile across a marsh. The species does not flock.

Favored habitat: marshes, bogs and swamps, especially where cattails and bulrushes grow. Solitary nesters, bitterns build 10- to 16-inch platforms of dried cattails, reeds or grasses on dry ground among tall vegetation. Eggs: 3 to 7, usually 4 to 5, buffy brown to olive-buff, unmarked. Incubation, mainly by the female, lasts 24 days, beginning with the first egg.

In spring, American bitterns are uncommon migrants in April and early May. In summer, they are breeding residents, nesting across the northern United States and southern Canada. They are uncommon fall migrants from August through September. Some birds winter in our state, but the majority migrate to the southern United States and Central America.

American bitterns have declined precipitously during the twentieth century. They're now listed as a threatened species in Pennsylvania.

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Wildlife Note — 49
LDR0103

Belted Kingfisher

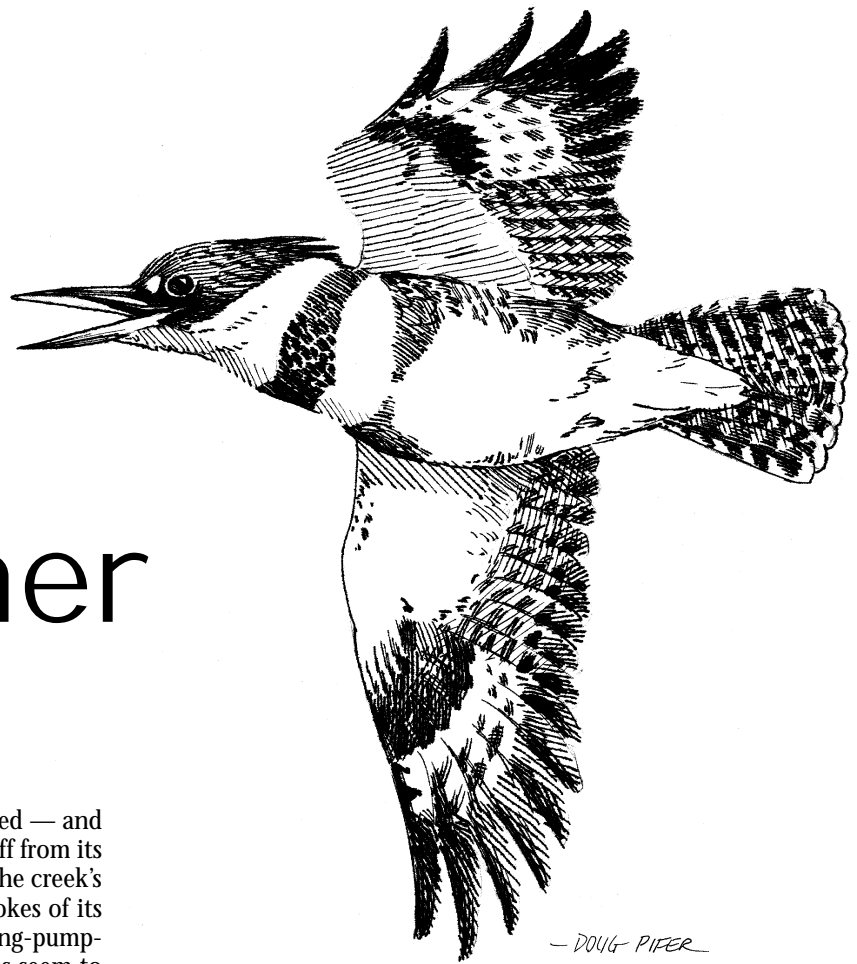
by Chuck Fergus

While paddling down a stream, I've often startled — and been startled by — a kingfisher. The bird takes off from its perch, sounding an alarm call that rattles down the creek's corridor. It flashes downstream, two or three strokes of its blue-gray wings, then a short glide, then more wing-pumping, sometimes skimming so low that its wingtips seem to brush the water's surface. When the bird reaches the end of its territory, it quietly loops around behind me. Sometimes I'm scolded by another kingfisher at the next bend in the stream. The belted kingfisher, *Ceryle alcyon*, belongs to Family Alcedinidae. Six species of kingfishers live in North and South America, and around 80 inhabit other parts of the globe. (Australia's laughing kookaburra is a well-known member of the family.) In North America the banded kingfisher breeds from Alaska to Labrador and south to Florida, Texas and California. It winters in the lower 48 states where open water remains available; some individuals go as far as northern South America.

Biology

A kingfisher has a stocky body and a large head with a ragged-looking double-pointed crest. The beak is sturdy and sharply pointed, the tail is short, and the feet — especially when considered along with the outsize head — appear to be absurdly small. Adults are 11 to 14 inches in length and weigh five to six ounces. The white neck ring and breast stand out against the blue-gray body plumage. The female has a belt of rusty feathers adorning her sides and breast, which the male lacks.

Kingfishers live along the banks of streams, rivers and lakes, where they catch fish near the surface or in shallow water. They mainly take fish that are four or five inches long or shorter. Kingfishers hunt from perches — branches, utility wires, pilings and bridge supports — or hover above the water while scanning for prey. A kingfisher dives into the water with its eyes closed and uses its bill to grab its prey. After catching a fish, the bird flies back to its perch, stuns the fish by whacking it against the perch, and swal-



lows it headfirst. Kingfishers take whatever types of fish inhabit a given waterway, from bullheads to sticklebacks to trout. When heavy rains make stream waters cloudy, kingfishers may turn to crayfish. They also eat mollusks, insects, reptiles, amphibians, and the occasional small bird or mammal. After feeding, a kingfisher coughs up a small pellet composed of indigestible matter such as bones and fish scales.

People often hear these alert birds before seeing them. The rattle call is given freely, both as an alarm signal and during territorial disputes. Mated pairs use a softer version of the same call to communicate with each other. Kingfishers become active just before sunrise, when they forage and patrol their territories; they do most of their feeding between seven and 10 in the morning and are less active during midday. At night they roost in trees. Kingfishers are solitary except when breeding. Both males and females defend individual territories, calling stridently and flying at and attacking intruding kingfishers. A territory may include 1,000 yards of stream or lake bank.

Migrating kingfishers return to Pennsylvania in March and April (others may have stayed through the winter, if streams did not freeze over). The male establishes and defends a breeding territory; once a female is attracted and the two pair up, she also defends the territory. During courtship, the male feeds the female. After mating, the male, followed by the female, may soar and then dip close to the surface of the water. Breeding peaks in early May.

Kingfishers nest in burrows that they dig into steep banks above streams, in road cuts, and in sand and gravel pits. Often the burrows are a few feet below the top of

the bank, where topsoil gives way to sandier subsoil. Burrows are usually near or along the water, but sometimes they're a mile or farther away. Both birds excavate the burrow, a task that may take three days to two weeks. The tunnel is three to four inches in diameter, slopes upward, extends a yard or two into the bank, and ends in an unlined chamber 8 to 12 inches across and six or seven inches high. Before entering, an adult will land on a convenient perch, give the rattle call, and fly straight into the burrow opening. To tell whether a burrow is in use, look for twin grooves on the outer lip made by the kingfishers' feet.

On the dirt floor of the nest chamber the female lays five to eight white eggs. Both sexes incubate the clutch, with the female sitting at night. The eggs hatch after about 24 days. The young are altricial; they have pink flesh, and their eyes are shut. The female broods them continuously for three to four days after hatching. The adults regurgitate fish to the young and, as the hatchlings grow and strengthen, begin bringing them whole fish as frequently as once every 20 minutes. After defecating, the young use their bills to peck or scratch at the nest chamber's walls, so that dirt covers up their waste. When two weeks old the young may crawl from the nest chamber into the burrow. They leave the nest four weeks after hatching; the parents hold fish in their bills, sit on a nearby perch, and coax the young into flying from the entry. The adults feed the fledglings for about three weeks as the young learn how to take crayfish, aquatic insects, and fish. Parents may teach their offspring to dive by dropping insects into the water beneath the youngsters' perch.

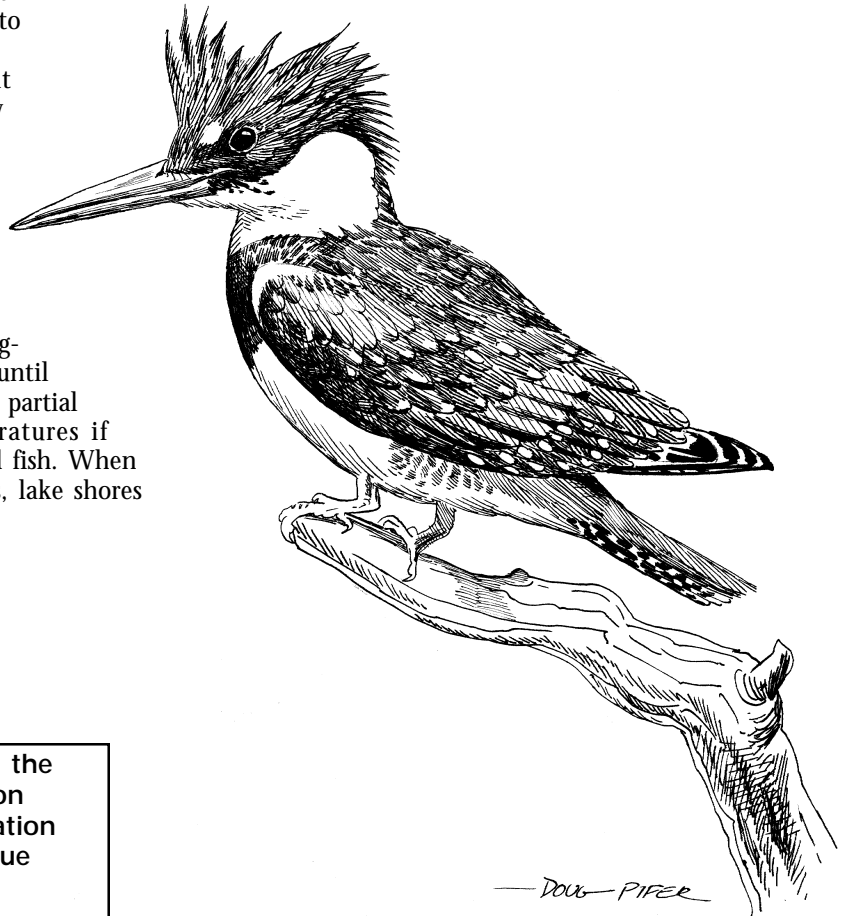
Skunks, minks, raccoons and black rat snakes kill some young in the nest; after they fledge, juveniles are vulnerable to hawks. Kingfishers escape from predators by diving into the water. Individuals breed during their first year after hatching. In the northern parts of its range, *Ceryle alcyon* raises one brood per year. After the mating season, pairs break up and individuals settle on and defend smaller territories. Kingfishers migrate south from mid-September until December. Most birds in the Northeast are partial migrants, able to survive winter temperatures if streams stay unfrozen, so the birds can find fish. When migrating, kingfishers tend to follow rivers, lake shores and coastlines.

Habitat

Kingfishers inhabit streams, rivers, ponds, lakes and estuaries. Individual territories often center on stream riffles, which are good fishing spots. Kingfishers prefer open running water that is not turbid. On lakes they use sheltered coves and shallow bays. For nesting they require earthen banks where burrows can be excavated; during breeding, kingfishers are sensitive to disturbance by humans and may desert an area if bothered too frequently. In winter they resort to rocky coastlines, swamps, brackish lagoons, oxbows, bayous, and shores of rivers and reservoirs.

Population

Pennsylvania is veined with streams, and kingfishers are widely distributed across the state. The birds are absent from places such as southern Clearfield County, where acid mine drainage has polluted long sections of waterways. Stream channelization destroys the vertical banks needed for nesting. Biologists believe that breeding densities reflect the number of suitable foraging sites, especially riffles. A study in Ohio found five pairs of kingfishers nesting along six miles of river shoreline; another study in New Brunswick documented 10 pairs in one mile.



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Wildlife Note — 37
LDR0603

Mallard

by Chuck Fergus

The mallard, *Anas platyrhynchos*, is the most common duck in the United States, North America and the Northern Hemisphere. It is among the best known and most widely recognized of all wildlife. The species possesses the largest breeding range of any bird on the continent, nesting across Canada and Alaska south to California, New Mexico, Kansas, Ohio and Virginia. Taxonomists recognize seven races. The mallard may have been the first domesticated bird, and from it have sprung all domestic duck breeds except the barnyard muscovy.

The mallard is known as a “puddle” or “dabbling” duck. This means it frequents shallow, marshy habitats, where it obtains plant and animal food on and near the water surface, feeding by dabbling with its bill in the shallows and by tipping up — hoisting its tail in the air and stretching its neck and head underwater. Like all puddle ducks, the mallard can spring directly into the air when taking off; it does not have to run across the water surface to build up speed like diving ducks do.

Biology

Length: adult male, about 24½ inches; adult female, 23 inches.

Weight: adult male, 2¾ pounds; female, 2½ pounds. The male, or drake, is easily recognized by his dark green head, the narrow white ring around his neck, and the dark chestnut breast. His rump is black, the outer tail feathers white, the underparts whitish, the sides gray, and the back brownish. The female, or hen, has a buff-colored head and a straw-brown body streaked or mottled with many shades of brown. The speculum (a brightly colored patch of feathers on the trailing edge of the wing and close to the body) is violet-blue bordered with white stripes on both edges. The male's bill is yellow, his legs and feet are orange-red. The female's bill is orange with dark spots, her feet orange.

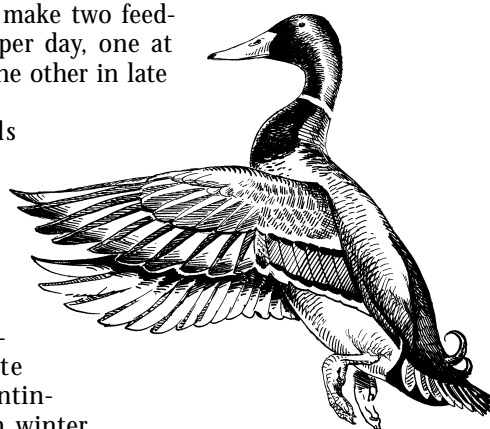
Mallards are among the most vocal of waterfowl. The hen makes a variety of quacks. The drake utters reedy quacking sounds and, during mating season, a sharp single

or double-noted whistle. Mallards fly in small groups or in V- or U-shaped flocks, usually with 10 to 20 members but sometimes with as many as several hundred. The mallard's broad wings and relatively short tail may create the impression that the wings are set farther back than on most ducks. Mallards are swift fliers and excellent swimmers. They may feed and rest in the company of other puddle ducks, including northern pintails and black ducks.

Mallards eat a variety of natural and human-produced foods. Natural items include seeds of bulrushes, pondweeds, millet, sedges, smartweed and wild rice; stems and leaves of many aquatic plants; and acorns. Ducklings feed mainly on insects, particularly mosquito larvae, and also on crustaceans in addition to plant parts. The mallard's bill has a serrated edge — the duck picks up food in the bill, forces water out through the serrations, and ends up with a mouthful of edibles and grit.

When natural foods are plentiful and available, mallards prefer them, but when ice closes up marshes, lakes and ponds, they head for dry land and corn. Perhaps more than any other duck, however, mallards are notorious for feeding in farm fields where they search for grain in the remaining stubble of corn and sorghum fields. Mallards travel up to 25 miles for food. Often they make two feeding flights per day, one at dawn and the other in late afternoon.

Mallards mature sexually in their first year. A period of social display begins in late fall and continues through winter



into spring. Males grunt and whistle, swim, pump their heads and preen in front of the females. The hens stimulate the courtship with calls and their own stylized body movements. Most pair-forming activities occur on the water, although chase flights in spring are prominent courtship rituals.

Most hens have chosen their future mates by the time mallards arrive on the northern breeding grounds in spring. The male selects a home breeding range that he defends against other mallard pairs; the female selects the actual nest site. Mallards primarily nest around fresh-water lakes, ponds, marshes and reservoirs across Pennsylvania, but it's not uncommon to find them nesting in agricultural fields and in residential areas.

The hen typically nests within 100 yards of water, on the ground in a depression lined with reeds and grasses, with soft down added from her breast. She conceals the nest in tall grass, dead reeds, alfalfa or clover. A few individuals nest in stumps, tree cavities or in the crotches of trees.

Eggs, from 6 to 15 but usually 8 to 12, are laid one per day. Shells are smooth, light greenish or grayish buff, sometimes nearly white. A hen occasionally will lay eggs in the nests of other ducks. Incubation is by the hen alone (the male deserts his mate at this time), beginning with the laying of the last egg so that all hatch at about the same time. Incubation takes 23 to 29 days.

Within about 12 hours of their hatching, the hen leads her young to water. Mallards normally raise one brood a year, but if a skunk, crow, raccoon, opossum or other predator destroys her first clutch, a hen may try again. Re-nesting attempts average fewer eggs (6 to 8). Nests are also lost to plowing, hayfield mowing and flooding. In addition to the predators mentioned above, snakes, foxes, largemouth bass, muskellunge and snapping turtles also take ducklings. The young can fly after 7 to 8 weeks.

After the drakes leave their mates (May to June), they fly to more secluded areas where they undergo their annual eclipse molt. This replacing of feathers demands considerable energy, and the birds seek out food-rich areas. A complete, simultaneous wing molt leaves them temporarily flightless; at this time they are in a drab "eclipse" plumage, which resembles the female's coloration and provides protection against predators. Hens undergo a similar molt after their ducklings mature. The wing feathers grow back in 2 to 3 weeks.

In fall and winter, mallards fly south when ice and snow cover their feeding and resting areas. Among puddle ducks, the mallard and the closely-related black duck are the latest fall migrants, often remaining as far north as open water prevails. Many of the mallards found here in the fall are from breeding grounds in Ontario, Quebec and the Lake States. The mallard is one of the earliest ducks to return north in the spring. In Pennsylvania mallards are common migrants in late February, March and early April.

The life span of the mallard is 7 to 9 years, although more than half die before they reach two years of age. Ducks die from predation, accidents, hunting and diseases — botulism, fowl cholera, duck virus enteritis, aspergillosis and others.

Population

In North America, the densest population of mallards is in the northern prairies of the Great Plains (Montana, North Dakota and the Canadian provinces of Saskatchewan, Alberta and Manitoba), with nearly half of the continent's mallards breeding there. Mallards winter throughout most of the United States, with heavy concentrations in the Mississippi Flyway. In the Atlantic Flyway they concentrate in South Carolina and on the Chesapeake Bay. They also winter in parts of Canada, Alaska, Mexico and Central America.

Compared to most species of wildlife, the mallard population has fared relatively well during man's changing of the environment over the past century. Waste grain left by mechanical harvesting equipment provides important winter food, and the construction of many ponds and reservoirs has created a good interspersed water and suitable land habitat for them. Mallards, more adaptive than other wild ducks, quickly exploit these chances, even in suburban areas.

In the Northeast, the mallard was considered a rare migrant at the turn of the century. Today it is the region's most common duck. In 1969, hunters for the first time bagged more mallards than black ducks in the Atlantic Flyway, a trend that continues today. The black duck, *Anas rubripes*, is a close relative of the mallard, and the two species hybridize readily. In the last several decades, the black duck's population has declined. Many scientists attribute the decline to, among other reasons, increased interbreeding with the mallard, and to the mallard's range expansion into formerly exclusive black duck habitats. Mallards currently comprise 50 percent of Pennsylvania's duck harvest.

Habitat

Mallard breeding habitat combines shallow-water foraging sites and thick vegetation for nesting. The species prefers open country to woodlands. Ponds, edges of fresh-water lakes, sloughs, reservoirs and marshes are ideal. Mallards often use man-made nesting structures placed over water. They winter on marshes, lakes, and the open waters of rivers and bays. They feed in these places and croplands.

Most waterfowl moves away from areas frequented by humans, and consequently have been driven from suitable habitat by expanding towns and cities, rural development and vacation homes. The mallard and the Canada goose, less wary of humans, are occupying much of this altered habitat.

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Wildlife Note — 41
LDR0103

Mice and Voles

by Chuck Fergus

They are the rarely seen multitudes, the small, unobtrusive creatures at the base of nature's food chain. Mice and voles are quick, prolific breeders. In terms of biomass — the total mass of living matter in a given area — they greatly outweigh the many predators that depend on them for food. Pennsylvania has two native species of mice, four voles, a bog lemming, two types of jumping mouse, and two European immigrant species. All are rodents, with two pairs of constantly growing, chisel-shaped incisor teeth, one pair on the upper jaw opposing another pair on the lower jaw.

Mice and voles mainly eat vegetation — nuts, seeds, fruits, leaves and grasses. Most species collect and hoard foodstuffs to eat at a later time and to subsist on over winter. In a small way, they may prey on insects and their larvae, snails, slugs, spiders and, in some cases, birds' eggs and other mammals. In turn, mice and voles are fodder for a vast assortment of predatory animals including snakes, shrews, weasels, raccoons, skunks, bobcats, foxes, coyotes, domestic dogs and cats, and even animals as large as black bears. Many hawks and owls prey mainly on mice and voles, and the larger herons take these rodents occasionally.

Mice and voles live in nearly every type of habitat, from rocky slopes in forested mountains and low boggy meadows to urban streets and inside peoples' houses. Some move about on the surface of the ground, while others keep to thick vegetation, rock crevices or tunnels. Most feed at night and remain active year-round. Only the jumping mice hibernate. During bitter cold, the other mice and voles become torpid and sleep for a time in their nests, round masses of leaves and grasses whose inside chambers are lined with soft plant matter. Some species are social in winter, when small groups huddle together for warmth.

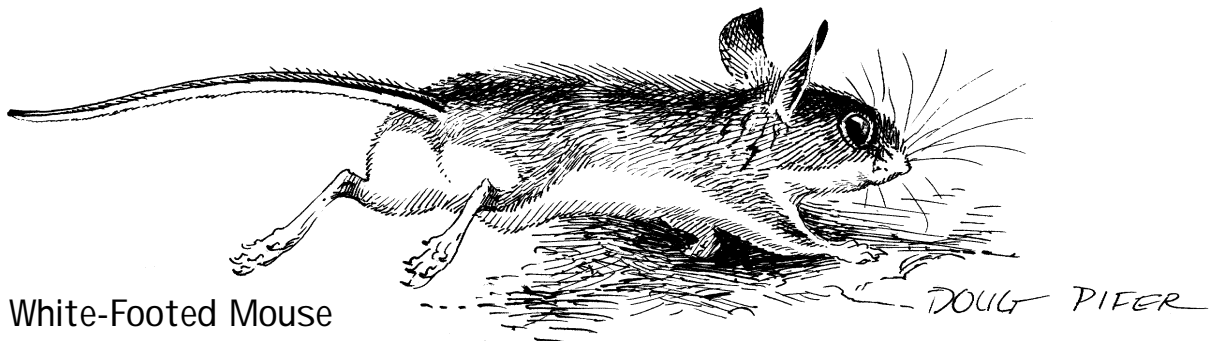
The gestation period for most mice and voles is around three weeks. Young are born without fur and with their eyes

closed. The mother nurses them, and they grow rapidly; litters are weaned and on their own within a month, and the mother — who has already ovulated and bred again — gives birth within a few weeks. Young from early litters can reproduce during their first year. In one of the most prolific species, the meadow vole, a female can potentially give birth to nine litters with a total of 72 offspring per year. It's not hard to see how quickly a population might explode were it not for constant attrition from predators, parasites, disease and accidents such as fires and floods.

Deer Mouse (*Peromyscus maniculatus*) — A small mouse with a huge range (the Northeast, Midwest and the West from Alaska to Mexico), the deer mouse occurs throughout Pennsylvania. It is 6 - 8.5 inches long, including the tail, which is three to four inches. A deer mouse weighs 0.4 - 1 ounce. For the first month of its life, an individual is colored gray; then it molts into its brownish-gray adult pelt. In both juveniles and adults, the undersurfaces are pure white. The deer mouse has large dark eyes well adapted to night vision.

Deer mice inhabit nearly every type of land habitat in Pennsylvania: farm fields, fencerows, grassy berms of roads, brushland and deep woods, both dry and damp, pine and hardwood. (Some taxonomists recognize two forms of *Peromyscus maniculatus*, the "woodland deer mouse" and "prairie deer mouse.") Deer mice eat seeds of many plants, cultivated grains, soybeans, corn, berries, buds, nuts and mushrooms. They consume beetles, grasshoppers, crickets and caterpillars (including those of the gypsy moth); other invertebrates such as earthworms, centipedes, slugs and spiders; and carrion.

Deer mice have sharp hearing and good eyesight. They locate most of their food by smell. They can swim if necessary and run at nearly five miles per hour for short dis-



White-Footed Mouse

tances. The tail, covered with fur, acts as a tactile organ and a balancing aid; when climbing, a deer mouse wraps its tail around twigs or branches to gain steadiness.

The species weaves ball-shaped nests, 6 - 8 inches in diameter, out of leaves, grasses and other plants, lined with fur, feathers and shredded plant matter. Deer mice nest in hollow logs, stumps, fenceposts, beneath rocks, in root channels underground and, rather frequently, in abandoned squirrels' and birds' nests in trees up to 50 feet above ground. Deer mice rest in their nests during the day, and there they rear their young. Nests at ground level may have a nearby burrow with a latrine area for waste and a chamber for storing food.

In winter, if snow covers the ground, deer mice spend most of their time beneath the white blanket, where the temperature is warmer than in the open air. They eat stored food. In extreme cold, deer mice cut down on their activity, sometimes sleeping for several days, perhaps huddled in a communal nest with two to four other mice (some of which may be white-footed mice, a different, although closely related, species). It's common for people to find deer mice using bird boxes in winter.

Deer mice breed from March to October. Females raise 3 - 4 litters per year, each with 3 - 7 young. In one year, a female can produce nearly 30 young, although few survive long enough to do so. Young mice, called pups, utter high-pitched squeaking sounds. Males do not help females raise the litters. Deer mice are preyed upon by foxes, cats, short-tailed shrews, mink, weasels, hawks, owls and snakes. Home ranges vary from 0.05 - 2.5 acres, with three to 36 mice per acre of habitat. Like most other small mammals, deer mice are very abundant in some years and rather scarce in others.

White-footed Mouse (*Peromyscus leucopus*) — Found statewide, this handsome nocturnal mouse may be the most abundant rodent in Pennsylvania. It looks much like a deer mouse, except that its tail is shorter in relation to its body. The coat is reddish brown above, white on the belly and feet. Length is 6 - 7.5 inches, including a 2.5- to 3.5-inch tail. Weight: 0.6 - 1 ounce.

White-footed mice live in shrubby areas, woods, cul-

tivated fields, pastures, rhododendron thickets, fencerows, stream margins, ravines, revegetated strip mines, and in farm buildings and houses. Some authorities believe the white-footed mouse prefers a slightly drier habitat than the deer mouse. White-footed mice nest in stone walls and rock crevices, under old boards, and in woodchuck burrows, beehives, tree cavities, and the abandoned nests of squirrels and birds. Like deer mice, white-footed mice do not dig burrows but use the runways of other small mammals. They are very agile and can climb trees. Individual home ranges vary from 0.11 - 0.86 acres, with males' ranges slightly larger than females'. From 1 - 13 white-footed mice may inhabit one acre.

White-footed mice eat about a third of their body weight daily, or around 0.2 ounces: seeds, nuts, berries, fungi, green plant matter, insects (chiefly caterpillars and ground beetles), centipedes, snails, and small birds and mice. They cache food in autumn, carrying seeds in their cheek pouches to chambers beneath logs and stumps. They breed from March through October; the three or four annual litters have 3 - 7 young apiece. Females can mate when two months old. Males sometimes help females rear the young.

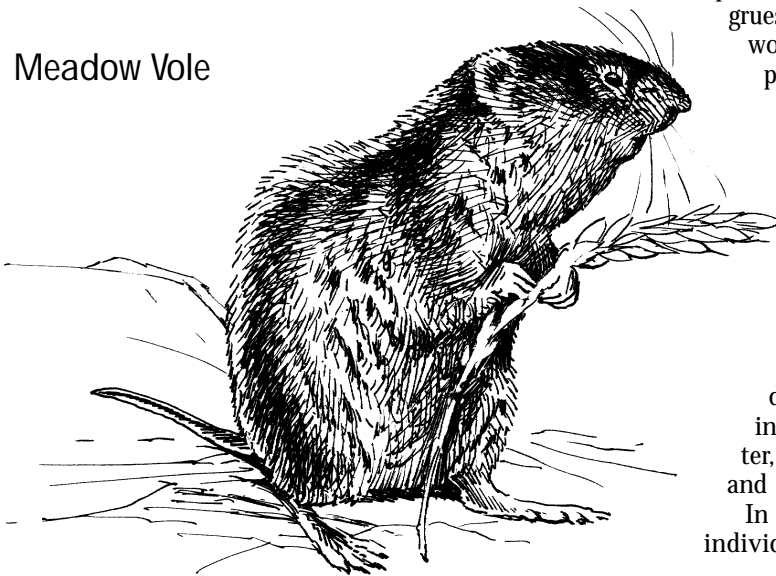
Meadow Vole (*Microtus pennsylvanicus*) — The meadow vole is a stocky mouselike creature with a blunt head, beady eyes and a short, scantily furred tail. Its upper parts are a dull chestnut brown, with a darker area along the middle of the back, and its underparts are grayish or buffy white. The meadow vole is 6 - 7.6 inches long, including a 1.3- to 2.5-inch tail; weight is 0.7 - 2.3 ounces. The species, often called a "field mouse," lives across northern North America and is the most common vole in the East. In Pennsylvania it is abundant statewide.

Meadow voles thrive in moist meadows and fields thick with grasses and sedges. They do not live in forests but may inhabit small clearings, bogs and grassy openings in the woods. They are good swimmers and can run at five miles per hour. Meadow voles move about in low, thick grass and weeds that screen them from hawks and owls. I remember one winter when the uncut hayfield next to a friend's house was practically swarming with meadow voles. (His dogs spent hours digging the rodents out, pouncing, then gruesomely eating.) I was struck by the intricate network of surface runways visible when the grass was parted: the small pathways (about the width of a garden hose) branched this way and that and were obviously much used by voles as they went about feeding on vegetation.

Meadow voles eat grasses and sedges (cut stalks with seedheads are stored in small piles in the runways to be eaten later), tubers, roots, grains and the inner bark of shrubs and trees; voles sometimes girdle small trees, killing them. Meadow voles are active all year, by night and by day, especially around dawn and dusk. Voles nest in shallow burrows three to four inches underground or hidden in grass. During winter, voles huddle together in the nests or move about and feed in runways beneath the snow.

In breeding season, meadow voles vigorously defend individual territories of 0.1 - 0.8 acres, larger in sum-

Meadow Vole



mer and smaller during peak population years — when up to 166 voles may live on a single acre. Usually a high population crashes to a low level, then builds up again to another high. Females produce from 8 - 10 litters in a high population year and 5 - 6 litters in a year when food is scarce. The average litter is 4 - 7. Among the myriad predators that attend to the vole population are herons, crows, gulls, foxes, house cats, weasels, opossums, skunks, shrews, bears, bass, pickerel and snakes. Many voles are snatched up by hawks and owls, particularly barn owls. In fact, the welfare of barn owls, short-eared owls and northern harriers is literally tied to the presence or absence, ups and downs of this species. Maximum longevity is around a year and a half in the wild.

Southern Red-backed Vole (*Clethrionomys gapperi*) — This rodent is 4.7 - 6.2 inches long, including a 1.2- to 2-inch tail, and weighs 0.6 - 1.3 ounces. A reddish band down the back and a pale gray belly distinguish the species. A woods dweller found in much of upland Pennsylvania, the red-backed vole favors cool, damp forests with hemlocks, mossy rocks, stumps and rotten logs. It also inhabits deciduous and mixed woodlands with mosses and ferns, rocky outcrops, stone walls, reverting fields and grassy clearings. When traveling, it uses the burrows of moles and shrews and casts about beneath the fallen leaves. It also climbs into low trees. The species breeds from late March through November, nesting in cavities or appropriating abandoned nests of other species. It feeds on nuts, seeds, berries, green vegetation, roots and fungi.

Rock Vole (*Microtus chrotorrhinus*) — This species of New England and Canada inhabits a limited area of northeastern Pennsylvania. It closely resembles the more common meadow vole, except that the rock vole has a yellowish orange nose. The rock vole inhabits forests. In Pennsylvania it lives in cool, damp woods of maple, yellow birch and hemlock, among boulders and lush groundcover, mainly ferns. Foods include green plants, seeds, leaves, stems, fungi and insect larvae. Weasels, foxes, timber rattlesnakes and copperheads prey on rock voles. Females bear 2 - 3 litters of 1 - 7 young each year. Considered rare in Pennsylvania, *Microtus chrotorrhinus* was classified as a "vulnerable" species by the Pennsylvania Biological Survey in 1985.

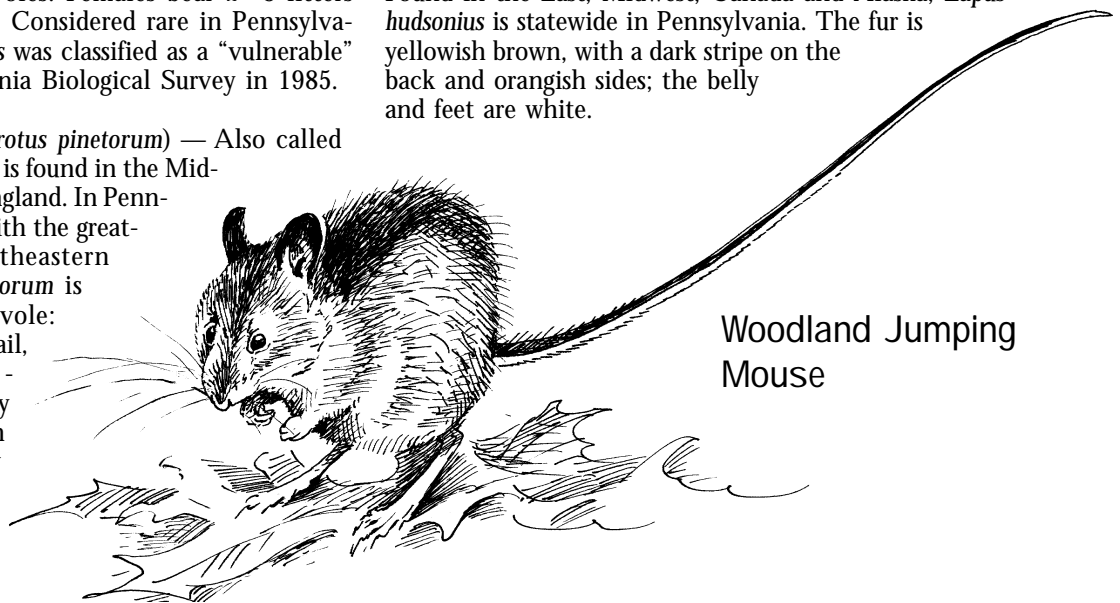
Woodland Vole (*Microtus pinetorum*) — Also called the pine vole, this species is found in the Midwest, the East and New England. In Pennsylvania it is statewide, with the greatest numbers in the southeastern lowlands. *Microtus pinetorum* is Pennsylvania's smallest vole: length, 4.3 - 5.5 inches; tail, 0.7 - 1 inch; weight, 0.9 - 1.3 ounces. Its soft, glossy fur is chestnut brown on the upper parts and gray on the belly. Preferred habitats include wooded bottomlands; hemlock and hardwood forests; old fields, thickets,

fencerows and farmland edges; and orchards.

The woodland vole is a molelike species that burrows beneath the soil just below the leaf litter. It breaks up the dirt with its head, incisors and forefeet, turns around, and shoves the dirt out the tunnel's entry, forming a cone-shaped pile two or three inches high. Meadow voles, hairy-tailed moles and shrews use the burrows of *Microtus pinetorum*. Woodland voles seldom leave their burrows, and an individual's home range is small, around a hundred feet in diameter. Foods include roots, stems, leaves, seeds, fruits and tree bark; in gardens, potatoes and flower bulbs are eaten. Woodland voles kill fruit trees by girdling the bark or damaging the roots. They cache food in storage chambers as deep as 18 inches underground, and they rear their young in nests under rocks, logs and stumps. Woodland voles breed less prolifically than other voles, bearing 1 - 4 litters per year, each with 1 - 5 young.

Southern Bog Lemming (*Synaptomys cooperi*) — The southern bog lemming looks much like the meadow vole, with chestnut brown upper parts and silver-gray sides and belly. Length is 4.5 - 5.7 inches, including a tail of 0.6 - 1 inch; weight is 0.9 - 1.6 ounces. The species is found in scattered pockets across Pennsylvania, mainly in old fields grown up with poverty grass, timothy, broom sedge, hawthorns, crabapples and locust. Bog lemmings live beneath matted dead grass in surface runways created by their cutting of and feeding on low-growing plants. They eat stems and seeds of grasses and sedges, along with berries, fungi and mosses. The species breeds from early spring to late autumn, with 3 - 5 young per litter and several litters each year. Southern bog lemmings often share habitats with red-backed voles, meadow voles, white-footed mice and deer mice.

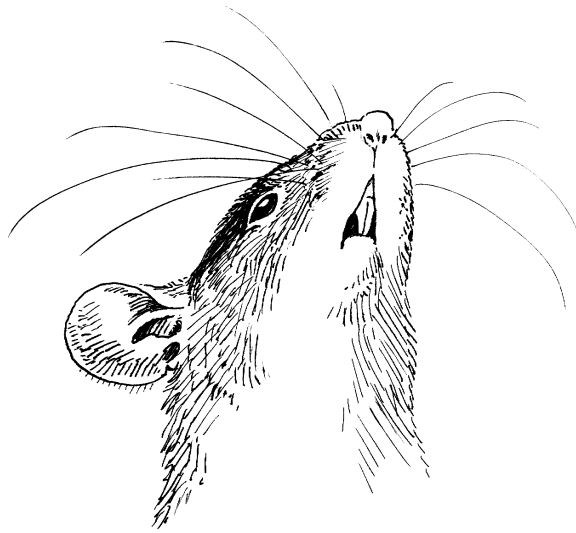
Meadow Jumping Mouse (*Zapus hudsonius*) — The meadow jumping mouse has big feet, long hind legs, and a skinny, tapering, sparsely furred tail that is longer than the head and body combined. Length is 8 - 9 inches, including a 5- to 6-inch tail; weight is around 0.6 ounces. Found in the East, Midwest, Canada and Alaska, *Zapus hudsonius* is statewide in Pennsylvania. The fur is yellowish brown, with a dark stripe on the back and orangish sides; the belly and feet are white.



Woodland Jumping Mouse

Meadow jumping mice inhabit moist grassy and brushy fields, thick vegetation and woodland edges. The home range is usually less than an acre. The name "jumping mouse" is something of a misnomer, as these animals do not normally travel by jumping: they prefer taking short hops of a foot or two. Active at night, they eat seeds, grasses, berries, nuts, roots, fungi, earthworms, insects, spiders and slugs.

The species breeds from May to October, with two litters of 3 - 6 young born yearly, in nests beneath boards, in hollow logs, and in grass tussocks. *Zapus hudsonius* hibernates in winter; in October or November, after laying on up to 0.2 ounces of body fat, the meadow jumping mouse retires to a nest about 18 inches below ground. The mouse curls into a ball, buries its nose in its belly, coils its tail around itself and sleeps. Its breathing lags, its temperature falls to a few degrees above freezing, and its heart rate slows to a few beats per minute. After six months' suspended animation, the meadow jumping mouse emerges in late April or early May.



House Mouse

Woodland Jumping Mouse (*Napaeozapus insignis*) — Found in the Northeast, New England and Canada, the woodland jumping mouse lives throughout Pennsylvania except for the southeastern lowlands. It is 8.4 - 9.8 inches long, including a 5.5-inch tail. It has a bright yellowish brown back and sides and a white belly; the tail is tipped with a prominent white tuft. *Napaeozapus insignis* prefers cool, moist hemlock-hardwood forests in the mountains; it lives near streams, rarely in open fields or meadows, occasionally in dry oak-and-maple woods.

Woodland jumping mice eat seeds, berries, nuts, green plants, fungi (particularly subterranean fungi of genus *Endogene*), insects, worms and millipedes. An individual home range is 1.2 - 8 acres. Although mainly nocturnal, woodland jumping mice venture out on cloudy days. They use burrows and trails made by moles and shrews. Normally they travel on all four feet, but for greater speed they hop with their long hind legs and can leap up to 10 feet. They evade predators by taking several bounds, then stopping suddenly under cover. Screech owls, weasels,

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skunks, minks, bobcats and snakes prey on woodland jumping mice. Like its cousin the meadow jumping mouse, the woodland species hibernates from October to late April or early May (about half the year) in an underground nest, singly or in pairs. Females bear 3 - 6 young in late June or early July; a second litter may be born in August.

Norway Rat (*Rattus norvegicus*) — The Norway rat is 12 - 18 inches in length, including a naked, scaly 6- to 9-inch tail. Weights range from 10 ounces to more than a pound. This rodent's fur is thin, coarse, reddish to grayish brown above and paler below. The species arrived from Europe aboard ships around 1775. Today it is found statewide, and it ranges across North and Central America.

Norway rats have poor vision, but their senses of smell, taste, hearing and touch are well developed. Extremely adaptable, they live in and under barns and farm buildings, in city sewers and dumps, along streams and rivers, and in marshes and open fields. They dig burrows about three feet long with several escape holes lightly plugged with weeds or dirt and hidden in grass or under rubbish. *Rattus norvegicus* lives in colonies composed of several family groups that share feeding and nesting areas. Although they're mainly nocturnal, rats also move about and feed during the day. Rats eat anything they can find or subdue, including fish, eggs, vegetables, grain, fruits, nuts, garden crops, carrion and garbage. They kill poultry, snakes, young rats from neighboring colonies, and wild birds; in local areas, rats may suppress or wipe out native birds and mammals, especially ground-nesting birds. In turn, rats are preyed on by dogs, cats, minks, snakes, and large hawks and owls.

Norway rats breed throughout the year, with peak activity in spring and autumn; a female may bear 6 - 8 litters per year, with an average of 6 - 9 young per litter. Rats carry many diseases, including rabies, tularemia, typhus and bubonic plague. Another introduced Old World rat, the black rat (*Rattus rattus*) used to be found in small numbers in southeastern Pennsylvania, but no longer seems to do so.

House Mouse (*Mus musculus*) — Like Norway and black rats, the house mouse is an Old World species inadvertently brought to North America by European settlers. It inhabits Pennsylvania statewide, living in and near houses and on farms. Six to 8 inches long, it has a 3-inch, scaly, nearly hairless tail; its weight is ½ - 1 ounce. House mice come in various shades of gray. Omnivorous, they eat everything from grain and seeds (their preferred foods) to paper, glue and household soap. *Mus musculus* is agile and quick, able to run at eight miles per hour. An adult female produces 5 - 8 litters annually, each with an average of 5 - 7 young. The species is active the year around.



Wildlife Note — 22
LDR0103

Minks and Muskrats

by Chuck Fergus

Often two wildlife species are associated closely with each other. The fox and the rabbit, the bobcat and the snowshoe hare, and the mink and the muskrat are good examples. While not one of the three mentioned predators subsists solely on its “partner” species, the prey often makes up a sizeable portion of the predator’s diet. When it comes to mink and muskrats, it’s fair to say that although the muskrat is not the principal prey of the mink, the mink is the principal predator of the muskrat.

Both mink and muskrats are found in suitable wetland habitat throughout Pennsylvania. They are classified as furbearers, and trappers harvest both species. By far, more muskrats are trapped than minks, but a mink pelt is more valuable than a muskrat’s.

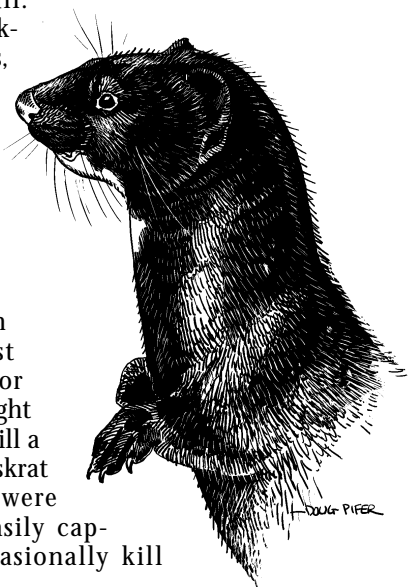
Mink (*Mustela vison*) — is a semi-aquatic member of the family Mustelidae. Other mustelids include weasels, martens, fishers, wolverines, badgers, skunks and otters. Mink are found over most of the northern hemisphere in both Europe and North America. They live on the edges of lakes, streams and rivers in forested areas.

Adult males average two feet in length, including an 8-inch tail. They weigh 1½ to 2 pounds. Females are 10 to 15 percent smaller than males and up to half a pound lighter. Body configuration resembles that of a weasel: short legs; long, bushy tail; long, sinuous neck and body; short head; and pointed muzzle. A mink’s coat is thick, full and soft. A short, tight layer of underfur is covered with longer guard hairs, which give the pelt its luster. Colors range from russet to a deep, chocolate brown. Unlike some weasels, the mink does not turn white in winter.

Mink have excellent hearing and sight, and a good sense of smell. On land, they travel at a slow, arch-backed walk or a bounding lope, which they can keep up for miles. They swim and dive with ease; a webbing of stiff hairs between the toes of their hind feet helps propel them through water. Mink are most active at night and early morning, although they sometimes venture out during the day as well.

Active year-round, mink may curl up and sleep for several days during winter cold spells. Like most mustelids, they are agile and fierce fighters, killing prey with a hard bite to the back of the skull.

Prey includes muskrats, mice, rabbits, shrews, fish, frogs, crayfish, insects, snakes, waterfowl and other birds, eggs and domestic poultry. Generally, a mink is an opportunist, feeding on whatever is most easily caught or found; thus, it might avoid fighting to kill a healthy adult muskrat if, say, crayfish were abundant and easily captured. Mink occasionally kill



more than they can eat. In winter, they cache carcasses and revisit them to feed.

Mink den in abandoned woodchuck tunnels, hollow logs, vacant muskrat lodges, holes in stone piles and beneath large tree roots. Dens are usually near water and may have more than one entrance. Mink line their nests with dried grass, leaves and feathers; bones and scraps of kills often litter the nest area.

Mink are basically solitary, except during mating season, when they use a powerful scent from their anal glands to attract mates. Males fight over receptive females. It's not known whether mink pair up after mating, although males are believed to mate with several females.

Mating occurs from February to April, with most activity in March. After mating, the fertilized eggs develop slightly, but then 13 to 50 days may pass before the embryos attach to the female's uterine wall and continue developing. This is called delayed implantation, and it's common among mustelids. Females give birth in early May following a gestation period of 28 to 30 days after embryo implantation. Thus, total time from mating to birth may be 40 to 80 days.

At birth, young are $3\frac{1}{2}$ inches in length, blind and hairless, and they weigh only a fifth of an ounce. Litters include 2 to 7 young, with an average of four. In two weeks, young are furred; their eyes open after five weeks; and after six or seven weeks they are out foraging with their mother and learning how to hunt. The family disperses by late summer. Minks are sexually mature at 10 months.

Minks are best suited for areas where water pollution is minimal, because these waters will hold the greatest concentrations and varieties of prey. A male covers a range up to three miles in diameter, while a female's range is much less. Individual territories overlap, and the same den may be used by several animals in succession. One mink will have several dens along its hunting route.

Minks live up to 10 years in captivity, but a wild one would be fortunate to survive two or three winters. Disease, cars and trapping are mortality factors, and the species is preyed on by foxes, bobcats and great horned owls.

The American mink was introduced to Sweden in the 1920s, and in 35 years spread throughout that country. M. lutreola, the European mink, is found from France east to the Caucasus Mountains. Pennsylvania has two subspecies of mink, the less common mountain race, *Mustela vison vison*, being somewhat smaller and darker.

Musk rats (*Ondatra zibethica*) — Why the name "muskrat?" "Musk" refers to a strong smelling substance released from this animal's perineal glands (between the thighs), while "rat" describes its rat-like appearance. The muskrat is a rodent — related to mice, voles, beavers

and rats. The nation's most abundant furbearer, the muskrat lives on or near the still or slow-moving water of ponds, marshes, streams and rivers and, to a lesser extent, faster mountain streams. The species is found over most of North America north of the Rio Grande River, including the coastal tidal marshes. It's common in Pennsylvania, but nearly abundant as it used to be.

Adult muskrats are 22 to 25 inches in length, including the tail. They weigh 2 to 3 pounds, have a stout body, short legs, and an 8- to 12-inch tail that is flattened vertically, scaly and practically hairless. Ears and eyes are small but well-developed. In appearance, muskrats resemble small beavers with long, rat-like tails.

The tail functions as a prop when the animal stands on its hind feet, and as a rudder and propulsion-aid when it swims. The muskrat's large, broad, partially webbed hind feet power it through water. Its forefeet are small and agile, with well-developed claws for burrowing. To insulate against cold water, a muskrat's underfur is dense, silky and soft, overlain with long, dark brown guard hairs shading to gray-brown on the throat and belly. Overall pelt color can be chestnut-brown to almost black, or any color in between.

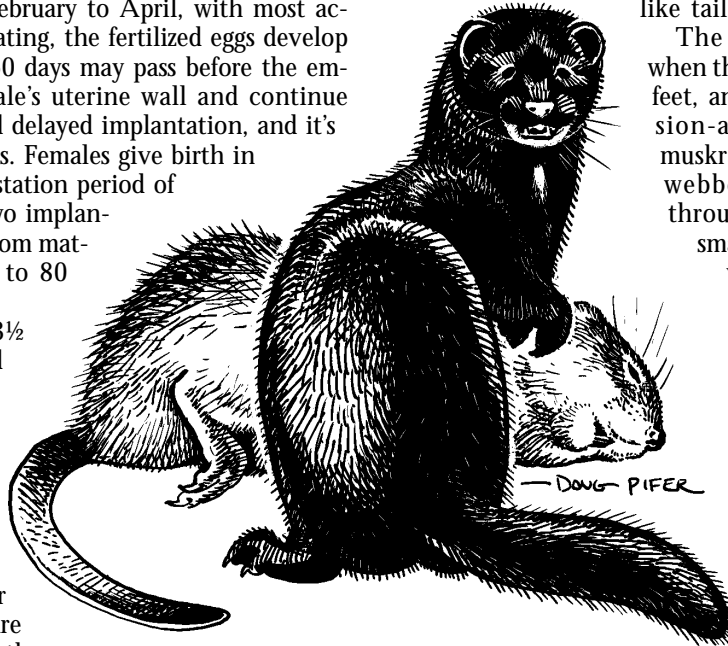
Food: roots and stems of aquatic plants

(the cattail is often an important item; also bullrushes, water lilies, pickerelweed and others), and, when they grow near water, legumes, grasses, grains, garden crops and fruits. Muskrats eat a small amount of animal protein, including crayfish, freshwater mussels, fish and frogs — the last two often as carrion — and even carcasses of other muskrats. They don't hibernate; over winter they subsist on roots and shoots dug from marsh bottoms, and the twigs, buds and bark of various trees, including willows, cottonwoods, ash and box elders.

Muskrats build houses (also called lodges) of vegetation, or they burrow into stream banks, earthen dikes and dams, often causing considerable damage. Both lodges and burrows have underwater entrances and above-water living quarters. Lodges are built of cattail stalks or other vegetation, chinked with mud and weeds above the waterline. They may be 8 to 10 feet across and 2 to 3 feet above water, with a single living chamber plus offshoots, or several chambers. Muskrats do not dam streams.

In breeding season, muskrats leave musk, or scent, in likely places around their territories to attract potential mates. Males may impregnate several females, and play no part in raising young.

Muskrats have a high reproductive potential, giving



birth to large litters and breeding from spring to fall. Mature females have two, three or even four litters each year, depending on the length of the warm season (more litters in southern Pennsylvania, fewer in the north).

After a 30-day gestation period, the female bears 5 to 8 naked, blind and helpless young. In a month they are weaned and fully furred, and the female drives them off, especially if she is about to bear another litter. A female may overwinter with her final litter of the year, the family breaking up in the spring. Young disperse along streams or colonize new sections of marsh.

Muskrats are sexually mature the year following their birth, but few survive long enough to breed. Young muskrats and dispersing immatures are especially vulnerable to minks, hawks, owls, foxes, snapping turtles and snakes. Surplus animals — individuals beyond the number that the habitat can support in good health over winter — are often lost to predators, taken by trappers or forced to move to new areas. Surplus individuals are more vulnerable to predation, starvation and disease than are members of the secure, basic population.

Some prey populations may limit their own numbers by failing to breed in crowded conditions, by aggressively defending a territory in overpopulated areas, or by some other type of behavior. Overcrowded

muskrats are strongly territorial, and predation by mink is just a way of reducing the excess population. Mink seldom have much effect on local muskrat populations; the surplus animals would probably die soon anyway. Only if the habitat should change, such as when drought comes and the marsh dries up, would formerly secure muskrats be vulnerable to minks; the habitat can no longer support as large a muskrat population, some of the basic population would become surplus. A bad winter,

an outbreak of disease such as coccidiosis, or a flood during the height of breeding season may also cut muskrat numbers. The population varies widely from year to year, but tends to show a peak in abundance about every 10 years.

Muskrats are tenacious fighters. Minks prefer to tackle young or sick muskrats, because a mature adult puts up a brisk defense. Females defending young have been observed driving off attacking minks. Muskrats are parasitized by mites, fleas, flatworms, roundworms and tapeworms.

While the average life span is under 12 months, some individuals may live as long as five or six years.

Through their feeding, muskrats open up areas of densely vegetated marsh; this can change local habitats to benefit waterfowl and other aquatic wildlife. Muskrats also damage agricultural and ornamental crops near water, and their tunnels riddle dams, dikes, canal banks, etc. This is a serious problem and trapping is the most effective and least expensive solution to it.



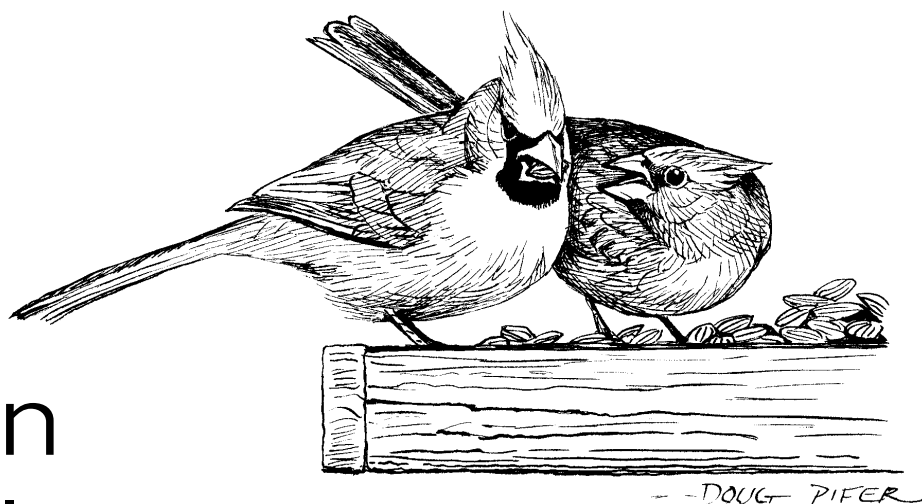
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Wildlife Notes

Allegheny Woodrat	Northern Cardinal, Grosbeaks, Indigo Bunting
Bats	and Dickcissel
Beaver	Opossum
Black Bear	Otter
Blackbirds, Orioles, Cowbird and Starling	Owls
Blue Jay	Porcupine
Bobcat	Puddle Ducks
Bobwhite Quail	Raccoon
Canada Goose	Rails, Moorhen and Coot
Chickadees, Nuthatches, Titmouse and Brown	Raptors
Creeper	Ring-necked Pheasant
Chimney Swift, Purple Martin and Swallows	Ruby-throated Hummingbird
Chipmunk	Ruffed Grouse
Common Nighthawk and Whip-Poor-Will	Shrews
Cottontail Rabbit	Snowshoe Hare
Coyote	Sparrows and Towhee
Crows and Ravens	Squirrels
Diving Ducks	Striped Skunk
Doves	Tanagers
Eagles and Ospreys	Thrushes
Elk	Vireos
Finches and House Sparrow	Vultures
Fisher	Weasels
Flycatchers	White-tailed Deer
Foxes (Red & Gray)	Wild Turkey
Gray Catbird, Northern Mockingbird and	Woodchuck
Brown Thrasher	Woodcock
Hérons	Wood Duck
Kingfisher	Woodpecker
Mallard	Wood Warblers
Mice and Voles	Wrens
Minks & Muskrats	



Wildlife Note — 54
LDR0103



Northern Cardinal

Northern Cardinal, Grosbeaks, Indigo Bunting and Dickcissel

by Chuck Fergus

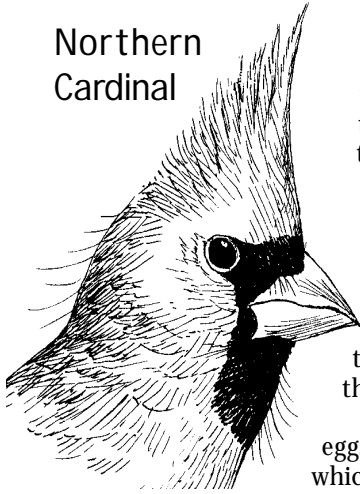
Cardinals, grosbeaks and indigo buntings are equipped with stout, strong bills to crush seeds. In addition to seeds and fruit (important fall, winter and spring foods), these birds eat protein-rich insects in summer and feed them to their young. They are attracted to thick cover including forests, woods edges, brushland, swamps and ornamental plantings in suburbs and cities. The dickcissel is a related species that breeds mainly in the Midwest but also nests in grassy habitats in Pennsylvania.

Northern Cardinal (*Cardinalis cardinalis*) — Adults are eight to nine inches long, slightly smaller than a robin. Both sexes have an orange-red bill and a prominent head crest. The male's plumage is an overall bright red; the female is yellowish brown with red tints on her wings, tail and crest. The cardinal is a common bird in the Southeastern United States. Before 1900, the species was rare in Pennsylvania, but over the last century cardinals have spread as far north as Maine and southern Canada. They now inhabit all of the Keystone State, except for areas of unbroken forest on the Allegheny High Plateau. Cardinals also breed across the Midwest and in Central America from Mexico to Guatemala. They are year-round residents throughout their range.

Cardinals live in thickets, hedgerows, brushy fields, swamps, gardens and towns and cities. They need dense shrubs for nesting; these can range from multiflora rose tangles sprawling between woodlots and fields, to hedges of privet and honeysuckle on shady streets. Hawthorns, lilac, gray dogwood and dense conifers also provide nesting cover. Mated pairs of cardinals use territories of three to 10 acres. Cardinals eat caterpillars, grasshoppers, beetles, bugs, ants, flies and many other insects; fruits of dogwood, mulberry and wild grape; and seeds of smartweeds and sedges, grains scattered by harvesting equipment, and sunflower seeds at birdfeeders. Cardinals are not particularly fearful of humans. One day a cardinal landed on a log about three feet from where I was. It furiously crushed a black beetle between its mandibles, discarded with a shake of its head the beetle's wing sheaths and spiny legs, swallowed the beetle, defecated and flew off: not just a flash of pretty color, I found myself thinking, but a fearsome predator in its own right.

Cardinals begin calling in February and March, signaling the onset of the breeding season. Males and females sing equally well. The song is a series of clear whistled notes, *whoit whoit whoit* (like a kid learning to whistle) or *wacheer wacheer*. Cardinals often countersing: males on adjacent territories, or pairs within their own territory, alternately match songs. As a part of courtship, the male will pick up a bit of food (such as a sunflower

Northern Cardinal



kernel at a feeder) in his bill and sidle up to his mate; the two touch beaks as she accepts the morsel. It takes the female three to nine days to build the nest, a loose cup woven out of twigs, vines, leaves, bark strips and rootlets, lined with fine grasses or hair.

Nests, rarely higher than six feet, are often placed in the thickest, thorniest scrub on the pair's territory.

The female lays two to five eggs (commonly three or four), which are whitish and marked with brown, lavender and gray. She does

most of the incubating, and the male brings her food. Young hatch after about 12 days. Their parents feed them regurgitated insects at first, then whole insects. The young fledge after 10 days; the male may continue to feed them for a few days while the female builds another nest and begins a second clutch. Cardinals can produce up to four broods per year. Nest predators include snakes, crows, blue jays, house wrens, squirrels, chipmunks and domestic cats. Brown-headed cowbirds often lay their eggs in cardinal nests, and the cardinals rear the cowbird nestlings. Cardinals compete with gray catbirds for food and nest sites; catbirds usually dominate in these interactions and may force cardinals to the fringe of usable habitat.

In fall the pair bond weakens between male and female. They stay together, however, and may join with other cardinals to form feeding groups that usually number 6 to 20 birds. In winter, white-footed mice sometimes move into old cardinal nests, stuff the cups with plant matter, and set up housekeeping. Cardinals are preyed on by hawks and owls, as well as foxes and other ground predators. The longevity record is 15 years.

Cardinal populations rose steadily in Pennsylvania through the 20th century. Several factors may have helped *Cardinalis cardinalis* over-spread the state during that period: an increase in edge habitats caused by rural development; a period of warm winters in the early 1900s; a similar warming trend in recent years; and an increase in backyard feeding stations dispensing high-energy seeds that help cardinals and other birds survive frigid weather.

Rose-breasted Grosbeak (*Pheucticus ludovicianus*) — Some outdoor enthusiasts believe that no thrush can hold a candle to the rich singing of the rose-breasted grosbeak, and that the latter is perhaps the handsomest bird in the woods. The male has a black

head, a massive ivory-colored bill ("grosbeak" means "big beak"), white patches on black wings that flash like semaphore signals when the bird flies, and a triangular bright red patch on the white breast. (The patch varies somewhat in size and shape from one individual to the next.) The female looks like a gargantuan brown sparrow. The song, given by both sexes, is robin-like but quicker, mellower, and full of life. Adults are about eight inches long.

Rose-breasted grosbeaks breed from Nova Scotia to western Canada and south in the Appalachians to Georgia. The species is found statewide in Pennsylvania: scarce in the developed and agricultural southeast, abundant across the northern tier. Grosbeaks favor second-growth deciduous or mixed woods and can also be found in old orchards, parklands and suburban plantings. They eat insects (about half the diet in summer), seeds (easily crushed by that formidable bill), tree buds and flowers and fruits.

Males arrive on the breeding grounds in April and May, about a week ahead of the females. Males sing to proclaim a two- to three-acre breeding territory and may attack other males who intrude. When courting a female, the male takes a low perch or lands on the ground, then droops his wings and quivers them, spreads and lowers his tail, and slowly rotates his body from side to side while singing. Rose-breasted grosbeaks often nest in thickets along the edges of roads, streams or swamps. The nest, built mostly by the female, is loose, bulky and made almost entirely of twigs. It is usually 10 to 15 feet above the ground in a small tree or shrub. Since both members of the pair do much calling (a short, metallic *chink* is often given) and singing in the vicinity, the nest is fairly easy to find.

The three to five eggs (typically four) are pale greenish blue, blotched with browns and purples. Both parents share in incubating them, and the eggs hatch after about two weeks. Both parents feed the young, which leave the nest 9 to 12 days after hatching. Should a female

start a second brood, she may leave the young while they're still in the nestling phase; the male assumes care of the first offspring while the female starts building a second nest, often less than 30 feet away from the first. Adults molt in August, and the male's new plumage includes brown and black streaks on the head, neck and back. In September rose-breasted grosbeaks start the migratory trek southward to wintering grounds in Central and South America.

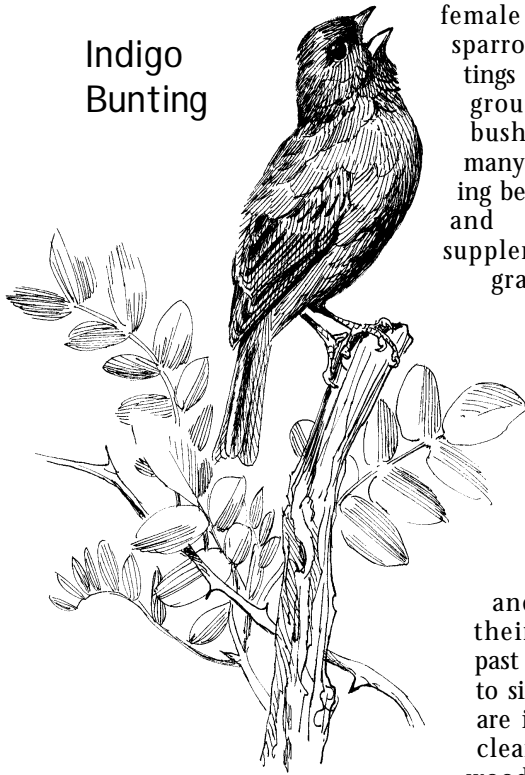
Rose-breasted Grosbeak



Blue Grosbeak (*Guiraca caerulea*) — Like the cardinal, this is a southern species that has expanded northward over the last century. In the 1980s blue grosbeaks were found nesting in southern Fulton, Lancaster and Chester counties and along the border of Delaware and Philadelphia counties near the Tinicum National Environmental Center. Males are a deep dusky blue; females are brown and sparrow-like. Blue grosbeaks inhabit open areas with scattered trees, fencerows, roadside thickets, reverting fields, brush and forest edges. They often feed on the ground and eat many insects, as well as the seeds of weeds, grasses and other plants. Breeding males sing from treetops and utility wires. The female builds the nest, a compact open cup, three to 10 feet above the ground, in a shrub, tree or vine tangle. The usual brood is four. Cowbirds often parasitize this species. Blue grosbeaks winter mainly in Mexico and Central America.

Indigo Bunting (*Passerina cyanea*) — The indigo bunting breeds throughout the East and in parts of the Midwest and Southwest. The species is statewide and common in Pennsylvania. Adults are about five and a half inches long, slightly smaller than a house sparrow. The male is bright blue, although he may look almost black in deep shade; the female is drab like a sparrow. Indigo buntings find food on the ground and in low bushes. They eat many insects, including beetles, caterpillars and grasshoppers, supplemented with grass and weed seeds, grains and wild fruits.

Indigo
Bunting



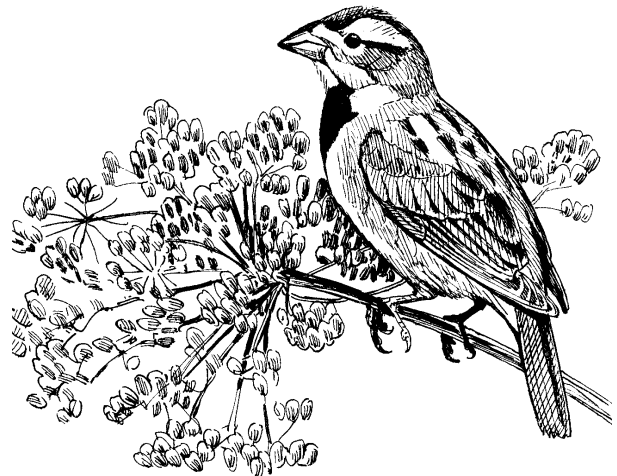
Males migrate north in late April and May, with older males preceding younger ones and returning to their territories of past years. The two-to six-acre territories are in brushy fields, clearings in woods, woods edges and along roadsides and powerline rights-of-way. Males make moth-like display flights along territorial boundaries, flying slowly with their wings fanned and tail and head held up, using rapid, shallow wingbeats while sounding a bubbly song. They also perch and broadcast a more complicated territorial/courtship song, a series of high, whistled notes described as sweet-sweet-chew-chew-seer-seer-sweet. Females, by contrast, are so shy and retiring that it's often hard to determine when they've arrived on the breeding range.

The male spends much time singing from prominent places, and little time helping with brood-rearing. The female builds a neat cup-shaped nest out of leaves, dried grasses, bark strips and other plant materials, one and a half to 10 feet up (usually no higher than three feet) in a dense shrub or a low tree, often an aspen. She lays three to four eggs, which are white or bluish white and unmarked. She incubates the clutch for 12 to 13 days, until the eggs hatch over a one- to two-day period. Some observers report that the male helps feed nestlings, while others say that he does not or that he gives food to the female who then carries it to the nest. Sometimes a male will have more than one mate nesting in his territory. Young indigo buntings leave the nest 10 to 12 days after hatching. In some cases, males take over the feeding of newly fledged young while females start a second brood. Males keep singing well into August. Most pairs raise two broods. Brown-headed cowbirds often parasitize the nests, and various predators — particularly the blue jay — eat eggs and nestlings. Some researchers believe that only 30 to 50 percent of indigo bunting nests are successful.

The adults molt in August. The male in his winter plumage looks much like the female, but he still has blue streaks in his wings and tail. Buntings migrate south from late August through October. Many individuals cross the Gulf of Mexico, reversing their spring passage. Indigo buntings winter in loose flocks in southern Florida, Central America, and northern South America. The longevity record is 10 years.

Dickcissel (*Spiza americana*) — The dickcissel is a bird of the prairies and a common resident of the Midwest. A rare breeding species in Pennsylvania, it has recently been found nesting in Clarion, Westmoreland, Somerset, Fayette, Franklin and York counties, mainly on reclaimed strip-mine sites, but also on cut hayfields, especially in years when drought stunts the regrowth of grasses. Nests are on or near the ground, hidden in dense grass, weeds or a shrub.

Dickcissel



Wildlife Notes

Allegheny Woodrat	Opossum
Bats	Otter
Beaver	Owls
Black Bear	Porcupine
Blackbirds, Orioles, Cowbird and Starling	Puddle Ducks
Blue Jay	Raccoon
Bobcat	Rails, Moorhen and Coot
Bobwhite Quail	Raptors
Canada Goose	Ring-necked Pheasant
Chickadees, Nuthatches, Titmouse and Brown Creeper	Ruby-throated Hummingbird
Chimney Swift, Purple Martin and Swallows	Ruffed Grouse
Chipmunk	Shrews
Common Nighthawk and Whip-Poor-Will	Snowshoe Hare
Cottontail Rabbit	Sparrows and Towhee
Coyote	Squirrels
Crows and Ravens	Striped Skunk
Diving Ducks	Tanagers
Doves	Thrushes
Eagles and Ospreys	Vireos
Elk	Vultures
Finches and House Sparrow	Weasels
Fisher	White-tailed Deer
Flycatchers	Wild Turkey
Foxes (Red & Gray)	Woodchuck
Gray Catbird, Northern Mockingbird and Brown Thrasher	Woodcock
Herons	Wood Duck
Kingfisher	Woodpecker
Mallard	Wood Warblers
Mice and Voles	Wrens
Minks & Muskrats	
Northern Cardinal, Grosbeaks, Indigo Bunting and Dickcissel	

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Wildlife Note — 25
LDR0103

Opossum

by Chuck Fergus

The opossum, *Didelphis virginiana*, is one of the world's oldest species of mammal, and the only marsupial on our continent. Marsupials are born before they are well developed, compared to other mammals, and continue their growth and development in a pouch on their mother's abdomen. Most members of the order Marsupialia are native to Australia and South America. Structurally, they have changed little for millions of years; the opossum's relatives date back to the Cretaceous Period, 90 million years ago. However, the opossum didn't appear in North America until the Pleistocene Epoch, less than a million years ago.

"Opossum" is derived from the Algonquin Indian word *apasum*, meaning "white animal." A creature without specialized body structure or food preference, the opossum thrives in many settings. It is found throughout Pennsylvania, and it is classified as a furbearer.

Biology

Mature opossums are 24-40 inches long, including a 10- to 12-inch tail. They weigh 4-12 pounds. Males are larger and heavier than females, and the average adult is about the size of a large house cat.

An opossum has a long, pointed snout with 50 teeth — more than any other North American mammal — small, dark eyes and rounded, bare ears. The tapering tail is naked and scaly, like a Norway rat's. Their feet have five toes, each with a claw, except the first toe of each hind foot, which is long and capable of grasping, like a thumb.

Their long, coarse body fur is light gray; outer hairs may be tipped yellow-brown. Legs and feet are dark brown or black. Males, females and immatures are colored alike, although

fur and skin color may vary among different geographic areas.

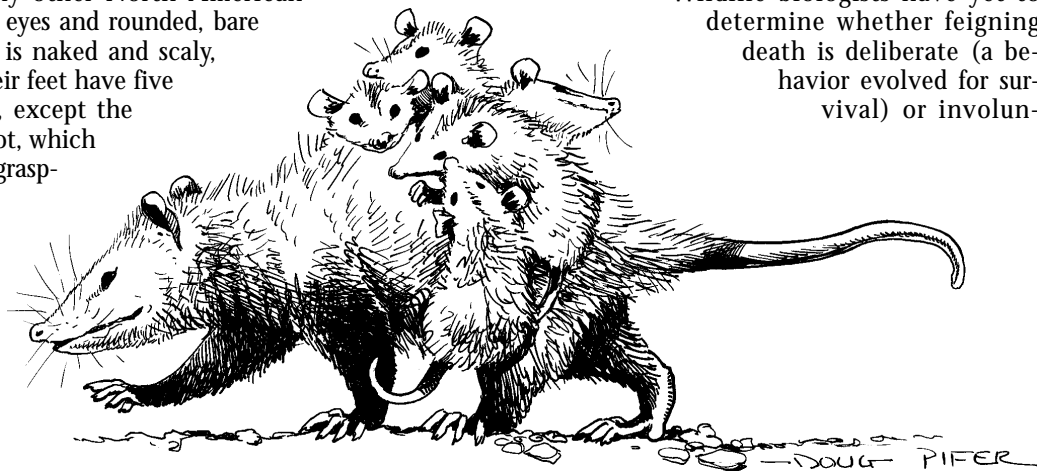
Opossums walk with an ungainly shuffle, averaging 0.7 mph; their running speed is a little over 4 mph. Excellent climbers, they ascend hand-over-hand, using their prehensile tails for gripping and balancing. They are good, but slow, swimmers.

An opossum's brain is small and of primitive structure. Senses of smell and touch are well developed, but hearing is not especially keen and eyesight is weak. When walking, an opossum sniffs the air and occasionally stops and stands on its hind feet to look around. Although normally silent, it may growl, hiss or click its teeth when annoyed.

If an opossum is threatened and cannot climb a tree or hide in rocks or brush, it may crouch and defend itself — or, if struck, may feign death.

When feigning death, also called "playing possum," an individual lies limp and motionless, usually on its side. Its eyes and mouth remain open, its tongue protrudes, its forefeet clench, and its breathing becomes shallow. This state may last from a few minutes to several hours. Feigning may help an opossum survive an attack, because some predators ignore dead prey. Opossums also exude a musky odor that may repel some enemies.

Wildlife biologists have yet to determine whether feigning death is deliberate (a behavior evolved for survival) or involun-



tary (perhaps caused by nervous paralysis).

Opossums are omnivorous and opportunistic — they eat whatever they can find. Animal food includes terrestrial and aquatic invertebrates (mainly insects), lizards, snakes, toads, the young of small mammals, bird eggs and young birds. Plant foods include berries (grapes, pokeberries, blackberries, etc.), mushrooms, acorns, cultivated plants. Opossums eat more animal than plant food. They consume garbage and carrion, including animals killed on highways. Sometimes opossums forage by day, but they are mostly nocturnal. They take shelter in hollow logs, woodchuck burrows, rock crevices, tree cavities, the abandoned leaf nests of squirrels and beneath porches and old buildings. They seldom spend two successive nights in the same den. Opossums do not dig their burrows, but they will occupy abandoned burrows.

Opossums are solitary. Females and unweaned offspring stay together, and the sexes come in contact during breeding season, late February and March in Pennsylvania. After mating, the female drives off the male. The male plays no part in raising young.

The opossum's gestation is short — 12 or 13 days. Newborn young are hairless, pink-skinned, blind and scarcely past the embryonic stage. They are about one-half inch in length and weigh 0.005 ounces. Hind limbs are rudimentary, but the front limbs and feet are well-developed and equipped with claws. The young crawl upward, with overhand strokes as if swimming, through the mother's fur to a pouch in the skin of her belly.

Most litters vary from 5-13 young, averaging 8 (as many as 21 have been reported). The pouch is lined with fur and contains mammary glands. When a young opossum attaches and begins to nurse, the nipple enlarges, forming a bulb on the end which swells in the baby's mouth and helps it stay attached. The female usually has 13 mammary glands, so offspring in excess of this number die. The mother can close her pouch to keep the young from falling out.

Young grow rapidly, increasing their weight 10 times and doubling their length in 7 to 10 days. By seven weeks, they are 2¾ inches long. After eight to nine weeks, their eyes open, and they let go of the mammary glands for the first time. They begin leaving the pouch for short periods, riding atop their mother's back, gripping her fur with their claws.

When three to four months old, young opossums begin to look for their own food and care for themselves. Soon they stop nursing, but they may stay with the female a few weeks longer. Six to nine young usually survive to fend for themselves.

Females may bear a second litter, breeding again from mid-May to early July. At least two weeks pass between weaning of the first litter and birth of the second, as the female is not sexually receptive while still nursing. Females can breed when they are a year old.

In fall and winter, opossums devote almost twice as much time to feeding and improving their nests as they do the rest of the year. Opossums do not hibernate, but may den up during cold or snowy periods. Although they add a layer of fat, they do not grow a winter pelt, and their fur is poor insulation. Pennsylvania is near the species' northern limit, and many opossums lose the tips of

their ears and tails to frostbite.

Ticks, fleas, cestodes and nematodes parasitize opossums, and the species is preyed on by foxes, bobcats, hawks and owls. Trappers also take some. Many opossums are killed by vehicles while feeding on other highway-killed animals. An opossum's life expectancy in the wild is about 1½ years, with a few reaching age 5.

Population

The opossum is common in wooded areas throughout Pennsylvania. On a continental scale, it ranges from southeastern Canada south through New England to Florida, west to Minnesota, Nebraska and Texas, and south to middle America. It has been introduced in several western states.

Opossums are unspecialized animals that can utilize a variety of foods and habitats. The species has expanded its range north and west during the past century. Their population is stable.

Habitat

Opossums are at home in farmland and woodlots, reverting fields, brushy woods, open woods, in dry or wet terrain and at varying elevations. They inhabit suburbs and the edges of towns where food and cover are available. Ideal habitat is bottomland woods surrounding streams.

An opossum's range depends on food availability and the individual's tendency to wander. In one study, biologists found that opossums had elongated, rather than circular ranges (circular being the pattern of most other land-based wildlife), following the edges of rivers and streams. The average home range was 0.6 miles, the study determined.

Where food is plentiful, an opossum may range only a few hundred yards; in intensely cultivated areas, where fencerows, rocky field corners and reverting fields have been cleared for crops, an opossum would have to range farther (up to two miles) to find food.

Habitat management aimed at helping other wildlife often benefits opossums. Forest thinning and edge planting stimulate the growth of low, food-producing plants (blackberries, wild grapes, etc.) and create thick cover for escape or daytime loafing. When managing a woodlot, sparing old wolf trees (wide-spreading trees with little timber value) preserves the hollow limbs used by opossums. Well-managed game habitat — such as a state game land — provides many wildlife species ample food and cover.

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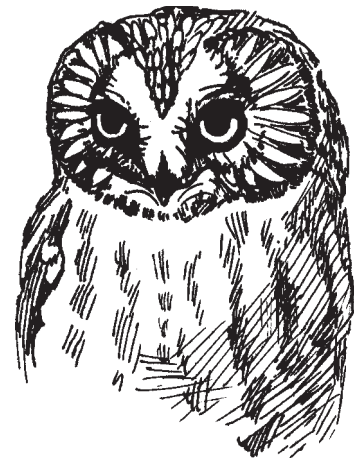
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Wildlife Note — 8
LDR0103

Owls

by Chuck Fergus



Saw-whet Owl

Owls are birds of prey, occupying by night the hunting and feeding niches hawks hold by day. Superb, specialized predators, owls are adapted to find, catch and kill prey quickly and efficiently. And they've been doing it for ages; owl fossils found in midwestern United States date back about 60 million years. Eight species of owls either live in Pennsylvania or visit the state in winter. Barn, screech, great horned, barred and long-eared owls are permanent residents; the short-eared owl is basically a winter resident, here from November to April; the saw-whet owl is a rare resident, seen most often from November to February; and the snowy owl is occasionally spotted in winter, especially in Pennsylvania's northern counties.

Taxonomists divide owls (order Strigiformes) into two families, Tytonidae — barn owls — and Strigidae, the family to which all other Pennsylvania owls belong. Our barn owl ranges over most of the world, with related species in South America, Europe, Africa, Asia and Australia. Strigidae have near-worldwide distribution, including most Pacific islands and the arctic.

The plumage of owls is dense and soft, making them look heavier than they actually are. Their drab-colored feathers blend into the background of shaded daytime roosts and the darkness of night; the feathers on owls' legs provide insulation and protect against bites by prey. Both sexes are colored essentially alike, but females are usually larger and heavier than males of the same species.

Some unusual and highly effective adaptations help owls survive. Extremely large retinas make their vision 50 to 100 times more efficient than human sight at distinguishing small objects in dull light. Also, the retinas are packed with rods (light-gathering cells). An owl can't distinguish colors well, but it possesses binocular vision: each eye views the same scene from a slightly different angle, thus improving depth perception. Eyes are fixed in the skull; to look to the side, an owl moves its head, and some species can twist their necks over 270 degrees — almost all the way around.

An owl's head is large and broad to accommodate two widely spaced and highly developed ears. Owls hear

sounds well below the threshold of human hearing; even in complete darkness a barn owl can catch prey by using just its hearing. The conspicuous "ears" or "horns" of great horned, long-eared and screech owls are really tufts of feathers that have little effect on their hearing.

The leading parts of a night hunter's wings — which cut the air when the bird flies — have soft, serrated edges. These soft leading edges, lightweight wings and a large wing surface area let an owl fly and glide in total silence. As its flight is noiseless, an owl easily hears other sounds while hunting. It descends to its target in a silent, moth-like glide.

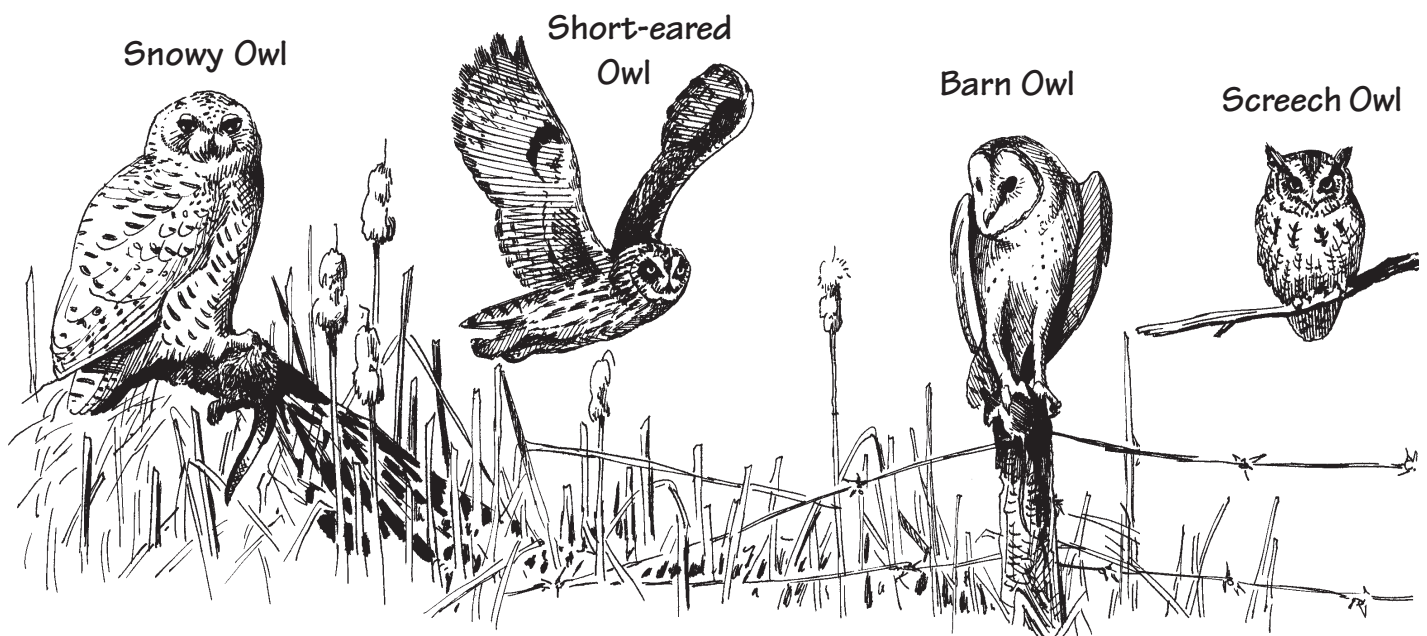
An owl grips and kills prey with its talons. Two of these strong, sharp claws branch off the front toes of the foot, and two off the back toes. If the prey is small enough, the owl swallows it whole; otherwise it holds the kill with its talons and tears the carcass apart with its hooked beak. The owl's stomach absorbs nutritious portions and forms indigestible matter (hair, feathers, bones, claws, insect chitin) into round pellets which are regurgitated about seven hours later.

Pellets, also called castings, can be found under daytime roosts or nighttime feeding stations. Generally, the larger the owl, the larger its pellets. Pellets can be broken apart and the hard bony parts separated from the fur and feathers. Close examination of the hard items gives insight into the owl's diet.

Most owls call to attract members of the opposite sex during mating season and to announce individual territory. They also call softly for short-range communication between mates or between parents and offspring. When cornered or frightened, owls hiss or make clicking noises by snapping their mandibles (upper and lower parts of the bill).

Owls don't build nests. Instead, they take over abandoned crow or hawk nests or use holes in trees or banks. They may add lining material to existing nests. Owls are early nesters, some even lay eggs in late winter; by the time fledglings leave the nest, offspring of other wildlife abound and are fairly easy prey for the inexperienced young owls.

Owl eggs are round, white and undecorated, usually



3-5 in number. Incubation is generally the female's responsibility, while the male hunts and brings food to the female. After the eggs hatch, both female and male feed the young.

Nestlings wear thick white or light gray down. Young found in the same nest are invariably of different sizes, because incubation starts as soon as the female lays the first egg (unlike most other birds, which begin incubating only after all eggs are laid), and therefore this egg hatches first. As much as two weeks may pass between the laying and hatching of the first and last eggs. Young hatched latest will die if the parents cannot find enough food in the area around the nest, as they can't compete with the larger, older nestlings. This natural check balances predator population with food supply and ensures that surviving fledglings are strong.

During the day, most owls stay in hollow trees or dark, dense stands of vegetation. They hunt mainly at night — occasionally at dusk or on cloudy days — quartering the ground in silent flight or scanning it from a convenient perch.

Owls generally kill what's easiest to catch or find. As with most predators, they are blamed for killing more game and poultry than they actually do. In reality, they are beneficial birds that prey on many pest species. Mice and rats form a major part of the larger owls' diets; smaller owls eat small mammals and insects. All Pennsylvania owls are protected by the Game Law and federal regulations.

Barn Owl

The barn owl is a long-legged, light-colored bird with a white, heart-shaped face. It is sometimes called the monkey-faced owl. A barn owl is 15-20 inches in length with a 44-inch wingspan; females weigh about 24 ounces,

males up to 20. Both sexes have whitish or pale cinnamon underparts and buffy or rusty upper plumage.

A barn owl has neither of two characteristics often associated with owls: "horns" or hooting-type calls. Its calls include a long, drawn-out whistle, loud hisses and snores.

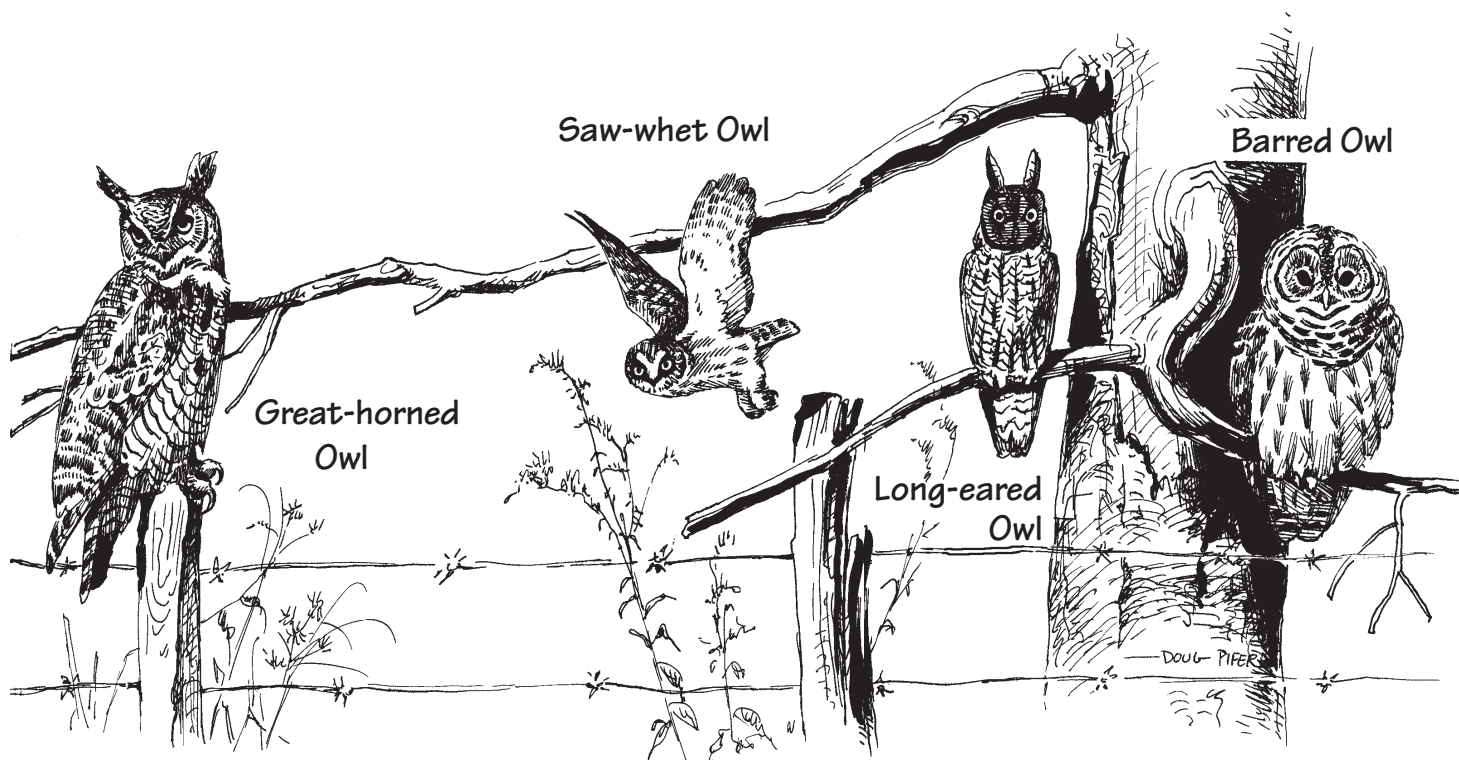
Barn owls nest in barns, hollow trees, old buildings, silos, ventilating shafts and church towers. They do not build nests, although castings may form a base for the eggs. They usually nest in March, April or May and lay from 3-11 eggs (generally 5-7) at 2- to 3-day intervals. Incubation takes about 33 days.

After the eggs hatch, both parents feed the young. Nestling barn owls can eat their weight in food every night. Young leave the nest at 9-12 weeks, after flight feathers develop.

Barn owls hunt open fields, flying low over the ground in search of prey. Ornithologists studied 200 disgorged pellets from a pair of barn owls that nested in a tower of the Smithsonian Institution Building in Washington, D.C. The pellets contained 444 skulls, including those of 225 meadow mice, 179 house mice, 20 rats and 20 shrews — all caught in the city. Other studies have confirmed mice and shrews as this owl's main prey items. Small birds, insects, flying squirrels and rabbits occasionally are taken.

Great Horned Owl

This large owl is sometimes called the tiger of the air; it is our fiercest, most powerful owl. It weighs up to 3½ pounds, is 20-23 inches in length and has a wingspan of nearly five feet. Females are slightly larger than males. A great horned owl has soft brown plumage above, mottled with grayish-white; undersides of light gray barred with dark; a "collar" of white feathers on the upper breast; a rust-colored face; and prominent ear tufts, the so-called



horns, up to two inches long.

The great horned is known as the hoot owl for its call, 3-8 (usually 5) deep, booming, uninflected hoots: *hoo-hoo-hoo hoo*. These owls hoot to stake out territory and as part of the species' mating activity, which in Pennsylvania takes place in December or early January.

Great horned owls are believed to mate for life. They nest in crow, heron or hawk nests, tree cavities or hollow stumps and are the earliest nesters of all owls. A mated pair cleans debris from an appropriated nest, and the female then partly lines a central hollow with feathers. She lays two or three eggs at several-day intervals, usually in February, and may temporarily get covered with snow while incubating.

Horned owls, especially incubating or brooding pairs, defend nests and young viciously and have even attacked humans who got too close. Eggs hatch in about a month; nestlings are downy-white, weak and blind. The young cannot fly until they're almost three months old and contour feathers have grown.

Great horned owls prey on rabbits, wood rats, mice, birds, hares, domestic poultry, grouse, squirrels, smaller owls, foxes, skunks (this species' defensive spray does not deter the great horned owl), domestic cats, weasels, muskrats — in short, most animals other than the large mammals.

Favored habitats are heavily forested land, large woodlots and remote wilderness areas; the species ranges over much of North America. Horned owls aren't often found in populated areas, apparently needing solitude for nesting.

Snowy Owl

Rare and irregular visitors to the Keystone State, snowy owls show up mainly from November to January. If food

is scarce on the arctic tundra, large numbers may migrate south. Population crashes of lemmings and hares — and the accompanying owl migrations — usually occur at 4- or 5-year intervals. Immatures, which are darker in color, go farther south than the adults.

Plumage of the snowy owl is white barred with grayish-brown; its feet and legs are heavily feathered. Full, soft feathering keeps the bird warm during periods of inactivity between winter hunting forays.

The snowy owl is as large as the great horned owl, with a 24-inch body length, 60-inch wingspan and body weight up to five pounds. It is a bird of open fields — not woodlands — which resemble its tundra home. It often perches on a fencepost to look for mice, ground squirrels, rats, rabbits and hares. The snowy owl is crepuscular (most active in twilight) but is forced to hunt in the day during the long arctic summer, when darkness is almost non-existent. In Pennsylvania, the snowy owl continues these habits and often hunts during the day. It does not call south of its arctic breeding grounds.

Barred Owl

The barred owl is a large bird of the deep woods. It has a rounded head, no horns and brown eyes (it's the only brown-eyed Pennsylvania owl except the barn owl; all others have yellow eyes). The barred owl ranges over the eastern United States, its distribution often coinciding with that of the red-shouldered hawk.

A barred owl weighs up to two pounds, with a 44-inch wingspan and body length up to 20 inches. It has gray-brown plumage with white spots on the back; whitish or grayish underparts are barred with buff or deep brown, the barring crosswise on the breast and lengthwise on the belly.

The barred is the most vocal of our owls. Its hoots are

more emphatic than those of the great horned owl's, but not as deep or booming. The barred owl's call is eight accented hoots, in two groups of four hoots: *hoo-hoo-hoo-hoo . . . hoo-hoo-hoo-hooaw* (described as "Who cooks for you, who cooks for you all?"). It usually calls early in the night, at dawn, and occasionally on cloudy days.

Barred owls almost always nest in hollow trees, laying 2-4 eggs that hatch in 28-33 days. Pairs may show strong attachment to the same nest area, returning year after year.

Long-Eared Owl

The long-eared is one of the most efficient mouse-catchers of the Pennsylvania owls. This slender, crow-size owl has long wings which make it appear larger in flight than it actually is; a long-eared has a 16-inch body length, a 40-inch wingspan and weighs about 11 ounces. This uncommon Pennsylvania resident gets its name from two prominent ear tufts.

While it looks a bit like a small version of the great horned owl, the long-eared can be told from its larger relative by a streaked belly — rather than barred — and closer-set ears. Like the great horned, the long-eared has a rusty face and grayish-brown plumage. The long-eared owl's call is a low, moaning, dove-like *hoo, hoo, hoo* repeated every three seconds or so.

Long-eared owls usually nest in dense conifers, frequently in old crow or hawk nests. Females lay 3-8 eggs (normally 4-5). Only the female incubates; incubation period is around 25 days, and the oldest owlet may be 8-10 days old when the last egg hatches.

Long-eared owls feed mainly on mice and shrews, occasionally taking birds, insects and frogs. They are probably the most nocturnal of our state's owls. Prime habitat is dense or open coniferous and deciduous forests.

Short-Eared Owl

Also called the marsh owl, the short-eared visits Pennsylvania mainly in winter. It is a crow-size owl (body length 13-17 inches, weight 15 ounces) with long wings (up to a 42-inch wingspan).

Its upper plumage is streaked and buff-brown, with large buffy areas on the upper wing surfaces; the breast is pale, boldly streaked with brown. The short-eared owl's ear tufts are small and hard to see, but its ear openings are large and its hearing excellent.

The short-eared is fairly diurnal (active in the day). It hunts over open country, and its irregular, flopping flight resembles that of a nighthawk or large moth. The short-eared is a fairly silent owl but occasionally sounds an emphatic, sneezy bark, *keaw, keaw*, or a hooting call described as *boo, boo, boo*.

At winter's end, most short-eared owls leave Pennsylvania and head north. Some remain in our state to breed, nesting in slight depressions in the earth or sand sparsely lined with grasses, weed stalks and feathers. Bushes or clumps of weeds often hide the nest. The female lays 4-7 eggs and incubates them about 21 days until they hatch.

Mice form over 75 percent of this owl's diet, but it also preys on shrews, rats and small birds. The short-eared depends mainly on its sense of hearing to locate mice. This owl avoids woodland; it is found in open country, fresh or saltwater marshes and boggy land.

Screech Owl

The screech owl is the only small Pennsylvania owl with ear tufts. It is 10 inches long, with a 22-inch wingspan and a 6-7 ounce body weight. The species is dichromatic, i.e. exhibiting two color phases — gray and red — independent of age or sex, consistent from first plumage to old age and frequently found in a single brood. Gray phase birds are a dappled brownish-gray; red phase individuals are chestnut-red, also dappled. The pale breast and belly are streaked with dark gray or chestnut, depending on the color phase. In Pennsylvania, the gray phase is probably ten times more common than the red phase.

A screech owl's call is termed a "quavering whistle," "mournful wail" or "long, descending whinny with tremolo, repeated at irregular intervals" (*huhuhuhuhu*, etc.).

Screech owls nest in unlined cavities of hollow trees, in abandoned holes of flickers and pileated woodpeckers and even in birdhouses. In March, the female lays 4-5 eggs; incubation takes 26 days. After hatching, young remain in the nest for one month.

Large insects such as grasshoppers, moths and beetles, mice, shrews, small birds, crayfish, frogs and flying squirrels form the screech owl's diet; most non-insect food is taken during winter. Screech owls hunt by flying low and swiftly over fields. Common in our state, they live in farm woodlots, orchards, stream edges and wooded areas of towns and cities.

Saw-Whet Owl

With a body length of eight inches and an 18-inch wingspan, the saw-whet is the smallest Pennsylvania owl. Its plumage is dull chocolate-brown above, spotted with white, and its undersides are white spotted with dark reddish-brown. Juveniles are a rich chocolate-brown over most of their bodies. This species has no ear tufts.

The saw-whet's call is a mellow, whistled note repeated mechanically, often between 100 and 130 times a minute: *too, too, too, too*, etc. This sound suggests the rasping made when sharpening a saw — hence the bird's name. The saw-whet is nocturnal and seldom seen. By day, it roosts in young, dense hemlocks or thickets.

Saw-whet owls breed from March to April; they nest in deserted woodpecker and squirrel holes, hollow trees or stumps and nesting boxes. Females lay 4-6 eggs that hatch after 21-28 days. Immatures leave the nest when about a month old. Saw-whets feed on insects, mice, frogs, bats, voles, shrews and small birds. In turn, they are preyed upon by barred and great horned owls.

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Wildlife Note — 19
LDR0603

Ring-Necked Pheasant

by Chuck Fergus

When man imports creatures to lands where they don't naturally exist, he often brews trouble. Consider the impact and spread of the rabbit in Australia, the red deer in New Zealand, and the English sparrow and starling in the United States. The ring-necked pheasant is an import, too, but unlike the species mentioned above, it hasn't become a pest. In fact, this Asian native has proven to be a fine member of North America's wildlife community. The ringneck is the hunter's bird — imported, stocked and transferred to suitable habitat throughout the nation by wildlife departments. Today, the ringneck benefits us all, providing enjoyment to hunters, birdwatchers and nature lovers of all types.

The species is found throughout the United States, except in the southeast, parts of the southwest, and the far north. Good populations exist in farming regions of the Midwest. The ringneck's scientific name is *Phasianus colchicus*, and it is a member of the Phasianidae, or pheasant, family. Closely related to quails and grouse, the ringneck belongs to the order Galliformes, which also includes turkeys, ptarmigan and prairie chickens.

Biology

An adult male weighs 2½- to 3½ pounds, an adult female, two pounds. Males are called roosters, cocks or cockbirds; females are hens. The standing height of a rooster is about one foot, and its length, from beak to tail tip, averages 36 inches. Hens are slightly smaller. A pheasant is long-legged and rangy through the body, with a long, pointed tail (20 to 23 inches) and short, rounded wings.

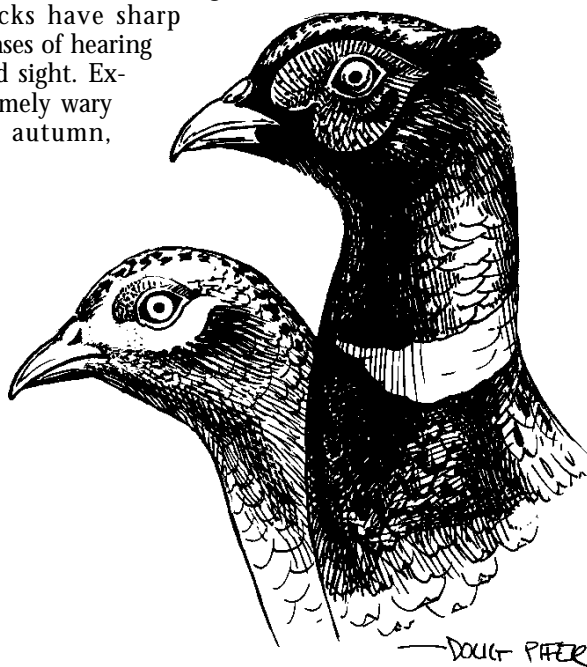
A hen's plumage is a subtle, camouflaging mixture of brown, black and gray. In contrast, a rooster's feathers are a beautiful mix of reds, browns, golds and black. A rooster has scarlet cheek patches, a white neck ring usually interrupted in the front, an iridescent greenish-black head, golden-brown breast, and a greenish-gray or blue-

ish rump and lower back. Tail feathers of both sexes are brown with black bars.

The crowing of a rooster is distinctive: A loud double squawk followed by rapid muffled wingbeats which may or may not be audible, depending on distance. Males crow most often during mating season, especially at sunrise and sunset; they may also emit a loud cackle when flushed into flight. Hens are normally silent.

Pheasants eat weed seeds (ragweed, smartweed, fox-tails, etc.), grains (corn, wheat, barley, oats, beans and buckwheat), fruits and berries (raspberries, dewberries, strawberries, thornapples and barberry), shoots, leaves, grasses, rose hips and insects. They find a lot of their food by scratching through ground litter.

Like most birds, ring-necks have sharp senses of hearing and sight. Extremely wary in autumn,



they stick to dense cover when hunted heavily. During spring and summer they can be seen strutting across freshly mowed fields and along roadsides. When pursued, pheasants would rather run than fly, dodging nimbly into heavy cover — brambles, honeysuckle or multiflora rose. When cornered or surprised, they take to the air. Strong fliers over short distances, they attain a maximum speed of 45 miles per hour in the open. Outside of breeding season (when roosters stake out individual territories) and brood-raising periods, pheasants are relatively gregarious, roosting in groups. In Pennsylvania, pheasants often roost in trees. The average pheasant ranges within one square mile.

Roosters claim individual breeding territories each spring. A rooster's courtship display includes spreading his tail and wings and strutting; his red cheek patches are swollen, his head is held low, and his neck feathers are ruffled. With luck and persistence, he will collect a harem of hens. Breeding begins in late March or early April and may extend into August. The male does not help incubate eggs or raise young.

Nesting occurs from April to August. A hen selects a nest site on the ground in a hayfield, a weedy field, an overgrown pasture or a brushy fencerow. A natural hollow (or one scraped out by the hen) is lined with weeds, grasses and leaves. Surrounding vegetation helps conceal both the nest and the laying or brooding bird.

The female lays 6 to 15 eggs (average is 10 to 12) over a 2-week period. Eggs measure about 1¼ by 1¾ inches and are light tan to pale olive green in color. Incubation usually doesn't begin until the last egg is laid, so all eggs receive equal incubation time and hatch on the same day. If eggs are destroyed by farm operations, predators, fires or floods, hens may reneest, some even making up to three attempts.

The eggs hatch after 23 or 24 days of incubation. Most clutches hatch by early July. Like the young of other gallinaceous species, pheasant chicks are precocial — covered with down, their eyes open, able to run about and eat as soon as their down dries. Chicks depend on the hen to shelter them from cold and rain (she does this by brooding, or sitting on top of them). Hens brood at night

until young are able to roost in trees. Instinctively, chicks squat and remain motionless at a signal given by the hen; their coloration, tan with darker brown streaking, conceals them well. Foxes, raccoons, crows, weasels, house cats, dogs and hawks prey on the young.

The hen guides her chicks in finding food; insects, plentiful and high in protein, are a good early food. By two weeks of age, chicks can fly short distances; after six weeks, their adult plumage starts to come in; and by autumn, birds of the year look like adults. Young roosters can be told from older males by the length and hardness of their spurs — appendages growing out from the backs of their legs. In young birds, the spurs are relatively soft, blunt, and short (a quarter-inch or less). Older roosters have hard, sharp spurs up to an inch in length from spur tip to the front of the leg.

In winter, pheasants may form flocks. During inclement weather, they stick to the thick protective cover of conifers, brushy sloughs or forests overgrown with vegetation. While not commonly occurring, the following diseases afflict pheasants: coccidiosis, blackhead and pullorum. Flukes, tapeworms and roundworms parasitize some individuals. There is an annual removal rate, from all causes, of 90 to 95 percent for roosters and more than 60 percent for hens.

Population

The first successful pheasant introduction to North America was a release of about 30 birds in Oregon's Willamette Valley in 1881. Many of America's ringnecks have descended from those 30, hybridizing with other imported strains. The Pennsylvania Game Commission began stocking pheasants in 1915.

Since Pennsylvania's ring-necked pheasant population peaked in the early 1970s, the annual pheasant harvest has declined from 1.3 million to about 250,000 birds. During its heyday, wild pheasants numbered in the millions and accounted for a majority of the harvest. As the '70s progressed, however, the pheasant population declined, and today pheasant hunting is largely sustained by stocked birds.

Wildlife managers have long contended that habitat loss and land-use changes have caused the ringneck's plunge. In recent years, thousands of farmland acres have been lost to industrial complexes, shopping malls, suburban developments and urban sprawl. On areas still being farmed, smaller fields have been consolidated into bigger ones to accommodate larger farm equipment, causing a loss of fencerows and other areas where pheasants once found food and shelter. Changing farming practices also include an increased use of pesticides and herbicides, which kill the insects and weedy cover vital to pheasants.

Nowadays hay is mowed earlier and more frequently, giving hens little or no time to raise a brood. Fencerows and wind-



breaks have vanished. Even harvested cornfields, always a popular hangout for pheasants, are chopped into silage, leaving little cover for wildlife.

In the '70s, pheasant chicks, for the first few weeks of life, could find all the food and cover they required without leaving the hay field they were hatched in. Now, if a hen is able to even hatch her brood before the hay is cut, she and her young must range farther to obtain adequate food and cover, greatly increasing their exposure to predators, cars and other dangers.

Habitat

Prime pheasant habitat is farmland that has occasional weed fields; blackberry, sumac and honeysuckle patches; swamp edges and marshy depressions grown up in cattails, grass and sedge; and overgrown drainage ditches. Clean-farming practices, where every bit of ground is put into production, reduce the diversity of food and cover pheasants need.

Winter food and cover are important to pheasant populations. Good foods are thornapples, apples, rose hips, skunk cabbage, ragweed, burdock, grapes, grasses, green vegetation and Japanese barberry; these, along with grain (especially waste corn left by mechanical harvesters) help birds overwinter. Pheasants locate food in areas melted or blown free of snow, or by scratching. Pines provide excellent cover for roosting and daytime resting. Pheasants also seek out densely vegetated marsh or creek-side areas during bitter weather.

Farmers can manage their land to produce more pheasants. Strips of corn may be left unharvested (5 to 10 rows next to cover are adequate); unpicked soybeans make



good summer, fall and winter cover, and the beans are eaten from fall to spring. Forest edges can be cut to increase low, brushy growth, which makes good cover. Autumn olive, honeysuckle and pine plantings also improve cover. However, these things alone will not increase the pheasant population. Safe nesting cover will. This is the most important factor when bird numbers fluctuate widely from year to year. To reduce nesting losses, farmers should delay their first alfalfa cutting until the end of June.

Given adequate food and protective cover, ringnecks can pull through rough winters. They are hardy birds and, like all wildlife, have keen survival instincts.

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Wildlife Notes

Allegheny Woodrat	Northern Cardinal, Grosbeaks, Indigo Bunting
Bats	and Dickcissel
Beaver	Opossum
Black Bear	Otter
Blackbirds, Orioles, Cowbird and Starling	Owls
Blue Jay	Porcupine
Bobcat	Puddle Ducks
Bobwhite Quail	Raccoon
Canada Goose	Rails, Moorhen and Coot
Chickadees, Nuthatches, Titmouse and Brown	Raptors
Creeper	Ring-necked Pheasant
Chimney Swift, Purple Martin and Swallows	Ruby-throated Hummingbird
Chipmunk	Ruffed Grouse
Common Nighthawk and Whip-Poor-Will	Shrews
Cottontail Rabbit	Snowshoe Hare
Coyote	Sparrows and Towhee
Crows and Ravens	Squirrels
Diving Ducks	Striped Skunk
Doves	Tanagers
Eagles and Ospreys	Thrushes
Elk	Vireos
Finches and House Sparrow	Vultures
Fisher	Weasels
Flycatchers	White-tailed Deer
Foxes (Red & Gray)	Wild Turkey
Gray Catbird, Northern Mockingbird and	Woodchuck
Brown Thrasher	Woodcock
Hérons	Wood Duck
Kingfisher	Woodpecker
Mallard	Wood Warblers
Mice and Voles	Wrens
Minks & Muskrats	



Wildlife Note — 24
LDR0603

Porcupine

by Chuck Fergus

The porcupine is a blackish, quill-armed, slow-moving rodent with an appetite for tree bark and salt. It lives in forests and often can be seen hunched into what appears to be a black ball high in a tree. While it doesn't occur in all parts of Pennsylvania, the porcupine is one of our best-known and most easily identified wild animals.

Its taxonomic name is *Erethizon dorsatum*. The word "porcupine" comes from two Latin words, *porcus* ("swine") and *spina* ("thorn"), which also reflect the species' colloquial name, quill pig. In the East, porcupines inhabit Canada and New England south into Pennsylvania; they range through the northern Midwest and the Pacific Northwest, south in the forested Rocky Mountains nearly to Mexico, and north to Alaska. They live at all elevations from sea level to timberline.

Biology

Adult porcupines are about 30 inches in length, including a 6- to 10-inch tail. They weigh 9 to 15 pounds, with bigger, older adults weighing up to 20. Males are larger than females. The porcupine is North America's second largest rodent; only the beaver is bigger. A porky has four incisors, two above and two below; they are bright orange, strong and adapted to gnawing.

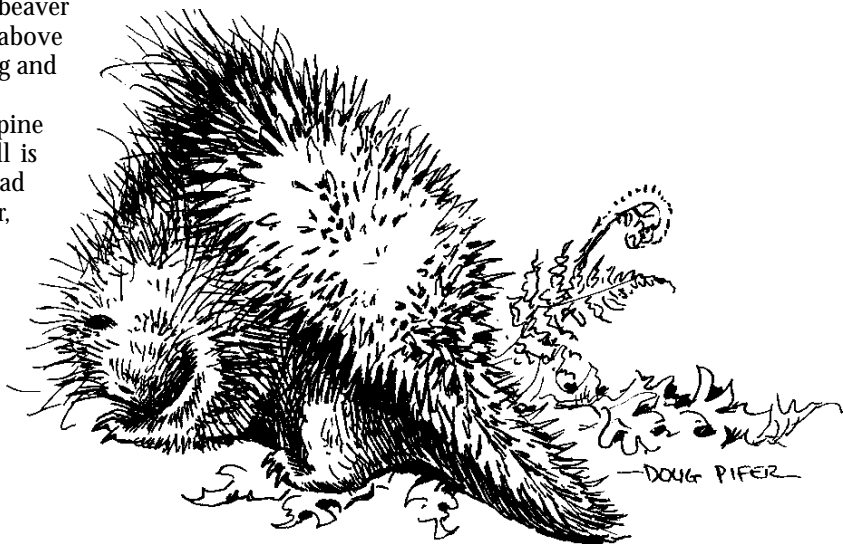
Short-legged and stout of body, a porcupine has a pronounced arch to its back. Its skull is heavily constructed; the small, rounded head has a blunt muzzle, ears almost hidden in fur, and dull black eyes. The front and back feet bear long, curved claws, and the soles of the hind limbs are thick-skinned and callused. The tail is short and club-shaped.

Porcupines vary in color from salty-black to brownish-black, sprinkled on the sides and belly with yellow- or white-tipped hairs. The summer sun bleaches the guard hairs of some porkies, giving them a grizzled appearance. Albinism sometimes occurs.

The most distinctive aspect of a porcupine's appearance is its coat of quills. Quills cover the animal's upper parts and sides from the crown of its head to the tip of its tail. They're 1 to 4 inches long (those on the animal's back are longest), yellow or white tipped with black, and lined with a foam-like material composed of many tiny air cells. An individual porky may have up to 30,000 quills.

When a porcupine is relaxed, the quills lie smoothly along its body, but when it feels threatened, muscle contractions cause the shafts to rise. In reality, quills are specialized hairs. The rest of the pelt consists of long, stiff guard hairs and soft, wooly underfur. Two molts occur each year: in spring, short hairs replace winter underfur; and in fall, the long, insulating underfur grows back in. At all times, quills are present and are replaced as they fall out.

To defend itself, a porcupine turns its back to a potential enemy, tucks its head between its front legs (or under a convenient shrub), and flails its quill-studded tail back and forth. It may back toward an adversary, chattering its teeth.



Porcupines cannot throw their quills, but because the quills are loosely attached, they dislodge easily on contact and stick in a victim's flesh. A single quill has a needle-shaped tip covered with hundreds of minute, overlapping, diamond-shaped scales. The scales slant backward and act as barbs. When a quill lodges in tissue, actions of the victim's muscle fibers engage the tips of the scales, drawing the quill or quill fragment inward up to an inch a day. A wild animal badly impaled in the body will suffer intensely; quills may pierce its heart, arteries, or lungs and cause death, or they may sever the optic nerves and cause blindness.

Slow and clumsy on the ground, porcupines are more at home in trees. A porky scales a tree by digging in with its sharp claws, pressing the rough, leathery soles of its feet against the bark, and bracing with its sturdy tail. It descends tail first.

On the ground, a porcupine can muster a top speed of about 2 mph over short distances. It waddles along in plantigrade fashion, on the soles of its feet with its heels touching the ground. Sensitive facial whiskers help it maneuver through thick underbrush.

A porky can see moving objects only at short range and is almost blind to stationary objects. Its hearing is probably inferior to that of most other mammals, but it has a keen sense of smell. A porcupine can swim, its air-filled quills helping to keep it afloat.

Porcupines are vegetarian. In winter, much of their diet consists of needles, twigs and small limbs of evergreens, especially hemlocks. They also eat the inner bark of trees: hemlock, spruce, white and pitch pine, basswood, sugar and striped maple, beech, birch, aspen, ash, cherry, apple and other species. In spring, summer and fall, porkies eat a wide variety of vegetation, including grasses, sedges, and the flowers, leaves, twigs, roots, buds, catkins and seeds of many other plants.

As a porcupine strips a tree of bark or foliage, small branches frequently fall to the ground; these trimmings play a minor role in providing food for other animals during winter.

In wild areas, porcupines gnaw on shed deer antlers. Closer to civilization, their chewing damages wooden buildings, telephone poles and ornamental trees.

Porcupines crave salt. They're attracted to and will gnaw on objects that have been in contact with human perspiration — axe handles, ropes, work gloves, leather boots, etc. They're occasionally seen along highways where salt has been used to melt ice. They're also said to relish the glue in plywood.

If a porcupine chews off an isolated section on a tree's

trunk, the bark will, in time, close over the wound. If a porcupine girdles the trunk, however, the tree will die. Trees with upper branches freshly "barked" (the newly exposed wood shows light against the bark) show that a porcupine's in the area. Beech trees are often damaged only at their bases, perhaps because porkies have a hard time climbing this smooth-barked species.

Although porcupines kill a few trees by girdling, most authorities agree the damage they cause over large areas is generally insignificant.

Porcupines grunt, groan, shriek, bark and whine; their calls may carry up to a quarter-mile. In breeding season, porkies are especially vocal.

Breeding takes place in September, October and into November, after a courtship often lasting several days. Courting porkies rub noses, chatter their teeth, walk on their hind feet or perform stylized, weaving body movements. Males are polygamous and play no part in rearing young. In females, estrus (the period when they're sexually receptive) repeats every 30 days until mating occurs or the breeding season ends.

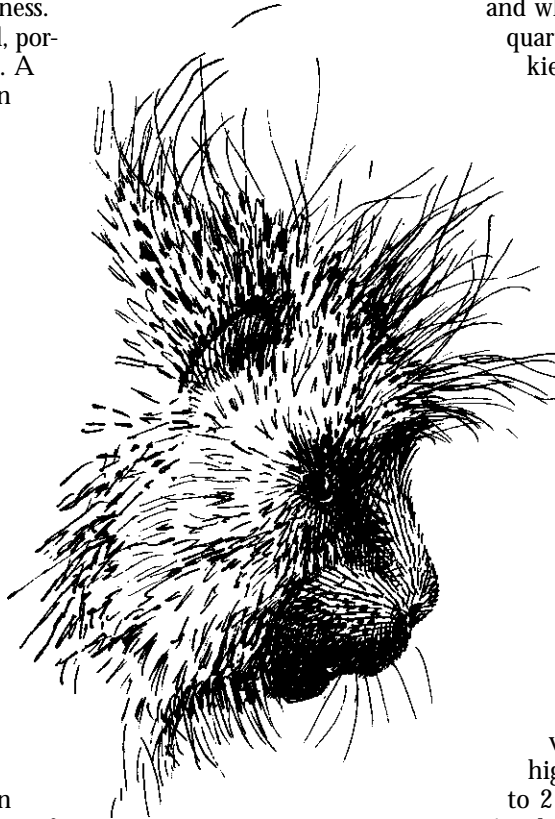
Unlike most rodents, porcupines are not prolific reproducers. Wildlife biologists have estimated that up to half of all adult females go unmated each year, and females that do become impregnated almost always produce just one offspring. The survival rate of young porcupines is high. After a gestation period of 205 to 217 days, the female gives birth in April, May or June. Birth may occur in a ground den, although the female doesn't generally select a particular site.

The young porcupine is called a "pup" or "porcupette." As might be expected after such a long gestation, it is precocial — it weighs about a pound, its eyes are open and it's about 10 inches long and fully furred. The quills are soft and hairlike, about a quarter-inch long, but they become hard and functional as they dry. Pups are able to climb trees and eat solid food within a few days. They nurse for about 50 days.

After weaning, pups receive little attention from their mothers; females and young separate for good after about six months. Young are sexually mature at 15 to 16 months and breed in their second autumn.

Porcupines den in caves, rock crevices, hollow logs and trees, deserted fox dens, brushpiles and abandoned buildings. They have a habit of defecating at their den's entrance, and the resulting pile of droppings is a good indicator of the animal's presence.

In winter, porcupines take to their dens for protection from snow, wind and predators. Several porkies may use the same den site, together or at different times. An



individual generally becomes resident at a den in November and uses it off and on until May. During winter, a porky may spend its days asleep in the den or in the top of a conifer in which it's been feeding. Porcupines do not hibernate.

Winter dens are rarely used in summer; during the warm months, a porcupine may choose a large deciduous tree — often an oak — as a daytime rest site. Porcupines are solitary in summer. Throughout the year they do most of their feeding and moving about at dusk, during the night, and at dawn.

In Pennsylvania, porcupines are preyed upon by foxes, coyotes, bobcats, dogs and owls. The fisher, reintroduced in Pennsylvania in the mid-1990s, has mastered the technique of flipping a porcupine onto its back, exposing the rodent's unquilled, vulnerable belly, and killing it with a swift bite. Fishers also kill porcupines with repeated bites to the face and head. Also, coyotes have been known to work in pairs to maneuver a porcupine onto its back.

Porcupines have a 10- to 12-year life expectancy in the wild. Mortality factors include predation (primarily by man), accidents (many porkies are killed on the highways) and disease. Porcupines are parasitized by lice, ticks and mites, some are afflicted with mange, and many have tapeworms and other internal parasites.

Population

In our state, most porcupines live in areas of extensive forests. They inhabit the rugged mountains of northcentral

Pennsylvania; the timbered land in the northwest and northeast corners; and the wooded sections of the ridge-and-valley region. Few, if any, porkies live in the southwestern or southeastern parts of the state.

Mammalogists have theorized that the porcupine originated in South America, crossed the Isthmus of Panama during the Pleistocene period, and overspread North America. Today, three other genera of New World porcupines inhabit South America.

Porcupines seem to be holding their own. The species thrives in a variety of forest, terrain and climate types across the continent — and it has few enemies in the wild.



Habitat

Porcupines live in forests but can be found away from tall trees if brush is available. They do well in mixed hardwood — conifer woodlands with suitable den sites — rock crevices, caves, hollow trees, etc. — and they live in wooded valleys as well as on the mountaintops.

The winter range of a porcupine includes its den, coniferous feeding areas (primarily hemlocks), and the travel lanes linking them — up to about 20 acres. A single animal may spend several months feeding on only one or two trees and using the land between them and its den. Summer ranges are larger, between 15 and 65 acres, with an average of 45 acres in deciduous woods. The summer ranges may be a half-mile or farther from the winter ranges, as den sites and conifers aren't important components of summer territories. In summer, porcupines favor deciduous forests, especially areas with high concentrations of oaks.

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Black Bear	Otter
Blackbirds, Orioles, Cowbird and Starling	Owls
Blue Jay	Porcupine
Bobcat	Puddle Ducks
Bobwhite Quail	Raccoon
Canada Goose	Rails, Moorhen and Coot
Chickadees, Nuthatches, Titmouse and Brown	Raptors
Creepers	Ring-necked Pheasant
Chimney Swift, Purple Martin and Swallows	Ruby-throated Hummingbird
Chipmunk	Ruffed Grouse
Common Nighthawk and Whip-Poor-Will	Shrews
Cottontail Rabbit	Snowshoe Hare
Coyote	Sparrows and Towhee
Crows and Ravens	Squirrels
Diving Ducks	Striped Skunk
Doves	Tanagers
Eagles and Ospreys	Thrushes
Elk	Vireos
Finches and House Sparrow	Vultures
Fisher	Weasels
Flycatchers	White-tailed Deer
Foxes (Red & Gray)	Wild Turkey
Gray Catbird, Northern Mockingbird and	Woodchuck
Brown Thrasher	Woodcock
Heron	Wood Duck
Kingfisher	Woodpecker
Mallard	Wood Warblers
Mice and Voles	Wrens
Minks & Muskrats	



Wildlife Note — 36
LDR0603

Puddle Ducks



by Chuck Fergus

Puddle ducks — also called dabbling ducks — are the largest and most widespread group of waterfowl in the world; they include the wild ducks most familiar to people. This Wildlife Note covers seven species commonly found in Pennsylvania (American black duck, gadwall, northern pintail, green- and blue-winged teal, wigeon, and northern shoveler); the mallard and wood duck are also puddle ducks, but they are featured individually in other Notes.

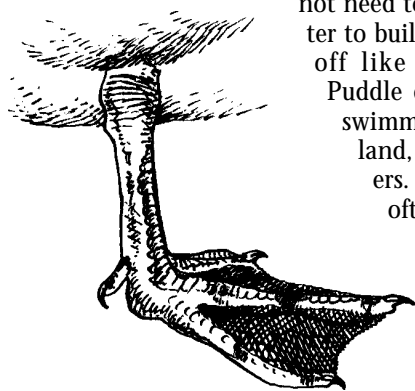
The two major duck groups, puddle and diving ducks, differ in several ways. Divers inhabit large deep lakes and rivers, and coastal bays and inlets; puddle ducks tend to stick to the shallows of lakes, rivers and freshwater marshes, although they frequent saltwater, especially during migration. Diving ducks are, as their name implies, adept at diving and obtain most of their food this way. Puddle ducks prefer to feed on the surface or close to it; often they stretch their heads underwater, feeding up-ended with their tails in the air. As a group, they are not accomplished divers, but adults dive occasionally and ducklings do so frequently.

Puddle ducks feed in the water along the fringes of islands and shorelines and on dry land. Their diet consists mainly of vegetable matter — seeds, grasses, leaves and stems of underwater plants, agricultural crops and nuts — along with mollusks, insects and fish.

These shallow-water ducks ride higher in the water than their diving cousins, and launch themselves directly upward when taking off; they do

not need to run across the water to build up speed for take-off like diving ducks do.

Puddle ducks are excellent swimmers, sure-footed on land, and swift agile fliers. On the wing, they often display a speculum, or wing patch — a bright, iridescent panel of feathering close to the body on the trailing edge



of each wing. Speculum color varies from species to species and may function as a flashing signal to help keep a flock together. To the human observer, the speculum is often a telltale field mark.

Within the species, males (called drakes) have bright, colorful plumage, while the females (hens) are drab. In fall, winter and spring, drakes are feathered in their normal bright coloration; in early summer, after breeding season, they molt into a drab “eclipse” plumage and resemble the hens for several months.

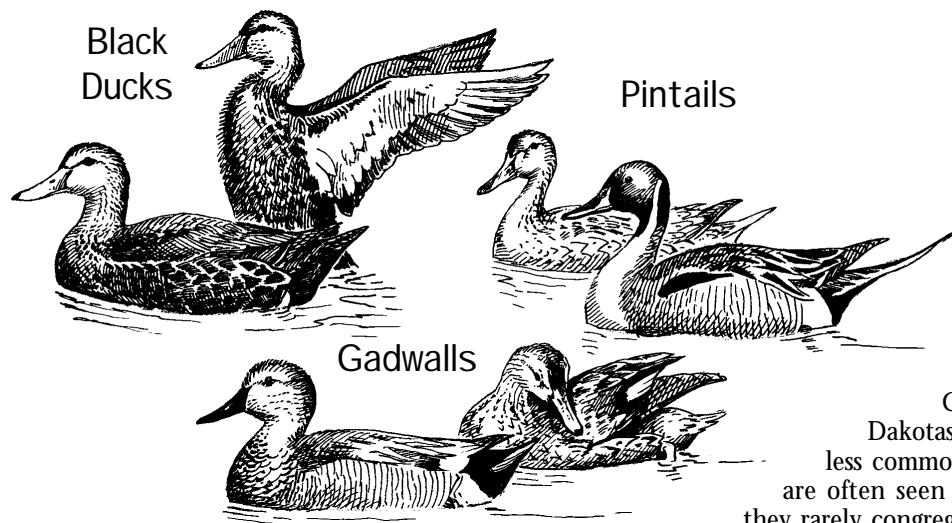
North American puddle ducks breed across the northern part of the continent; some species — mallards, black and wood ducks — nest in Pennsylvania. They generally mate for the first time when a year old. During courtship, drakes chase the hens and engage in fighting, ritualized movements, posturing and calling. After mating, the drake leaves immediately, or he stays with the hen while she is laying and then departs soon afterward. Pair bonds are weak, and a different mate will be courted each year. The hen lays a large clutch of eggs (7 to 13, depending on the species) in a nest built of grasses, leaves and reeds, hidden among vegetation. She incubates and cares for the brood by herself.

Ducklings are covered with down; they are a pale brownish color, streaked with darker lines to disguise their body outlines. Minutes after hatching, they can swim and feed themselves. They first fly at about two months of age.

In autumn puddle ducks fly south, along with diving ducks and geese. Waterfowl start migrating through Pennsylvania in late August; the movement peaks in October and ends in December. Some puddle ducks occasionally winter in Pennsylvania, but most spend the cold months across the southern United States and in Central America.

Raccoons, foxes, minks, hawks and owls prey upon ducks. Raccoons, skunks and crows eat the eggs; snapping turtles and fish take the young.

Taxonomists group puddle ducks in family Anatidae, subfamily Anatinae. The Anatinae form the largest and most diverse of the commonly recognized waterfowl subfamilies, with more than 40 species worldwide. Pennsylvania puddle ducks all belong to genus *Anas*.



American Black Duck — Length, 21 to 26 inches; average weight, 2.4 to 2.8 pounds. Also called “black mallard” or “red leg.” Plumage is a dark, mottled brown with white underwings and a violet-blue speculum. When visibility is good, the contrast between the light-brown head and the brown-black body is noticeable. This is our only puddle duck in which the plumages of both sexes are almost identical; the drake in nuptial plumage has a bright yellow bill, contrasting with the female’s olive-green bill. The voice of the hen is a loud *quack*; of the drake, a lower-pitched *kwek-kwek*.

Black ducks eat a variety of vegetable foods, including eelgrass, widgeon grass, and the seeds of sedges, bulrushes, wild rice, pondweeds, smartweeds and millets. On land they feed on acorns and waste corn, willingly flying up to 25 miles to a reliable source of the latter. Animal foods, more important in winter, include periwinkles, mussels and snails.

Black ducks breed in Pennsylvania, nesting in marshes, bogs, and lake and stream margins, and often in wooded uplands. They nest on the ground, on stumps and dead snags, and occasionally in tree cavities; eggs, 8 to 10, hatch in about 4 weeks.

Once the most popular duck in the waterfowl hunter’s bag, the black duck has dropped to third place, behind the mallard and wood duck. The black duck population declined steadily in the 1960s and ’70s. In 1982, harvest restrictions were implemented and the population appears to have stabilized, but is well below its historic numbers.

Gadwall — Length, 19 to 23 inches; average weight, 1.8 to 2.2 pounds. Sometimes called “gray duck.” Males in breeding plumage have brown heads, gray bodies and black tails. The female is similar, but more brown in color. The legs are yellow. This is the only puddle duck with white in its speculum. The drake whistles and sounds a *kack-kock*; the hen quacks like a mallard, but more rapidly and higher pitched.

Food is basically aquatic plants. On brackish or freshwater estuaries where they often winter, gadwalls concentrate on vegetation such as widgeon grass, eelgrass,

muskgrass and pondweeds. In Pennsylvania, gadwalls are uncommon. They are considered non-breeding residents, although they have nested in Crawford and Butler counties. They breed mainly in the western United States, Canada and Alaska. Hens seek dense, dry weed cover, hiding the nest from above and all sides. They lay about 10 eggs, which hatch in 26 days.

Gadwall are most plentiful in the Dakotas and Canada’s prairie provinces, less common on the Atlantic Flyway. They are often seen with pintails and wigeons, but they rarely congregate in large flocks. The gadwall dives more often than any other puddle duck.

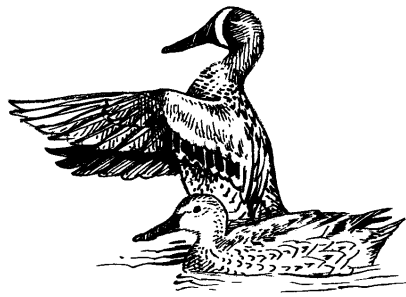
Northern Pintail — Length, 20 to 29 inches; average weight, 1.9 to 2.3 pounds; slender and trim. Also called “sprig.” Among the most beautifully marked of our ducks, a pintail male in breeding plumage has a brown head, white neck and breast, and a gray back and sides. Females are grayish brown. The speculum is metallic greenish-brown with a white rear border, but far more noticeable in flight is the male’s long, slender, pointed tail. Pintails are extremely graceful and fast fliers, fond of zigzagging from great heights before leveling off to land. Voice: the drake has a flute-like whistle, the hen a soft *quack*.

In summer and fall, pintails feed largely on seeds and vegetative parts of pondweeds and widgeon grass, and on the seeds of bulrushes and smartweeds. Nesting females eat more aquatic insects. Sometimes pintails land in harvested fields to glean waste corn. They breed mainly across Canada, the northwestern United States and in Alaska, also in the Eastern Hemisphere; in Pennsylvania, nests have been reported in Crawford County and the John Heinz National Wildlife Refuge at Tinicum near Philadelphia. Pintails often nest in dead herbaceous cover of the past year’s growth, which may offer little concealment; the site is usually within 100 yards of water, but may be up to a mile away. Females lay about 9 eggs; they hatch following a fairly short incubation period of 21 days. A few pintails winter in Pennsylvania, but most fly to the southern United States and Central America.

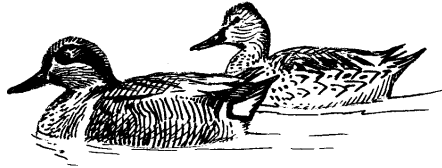
Green-winged Teal — Length, 13 to 16 inches; average weight, ½ to 1 pound; the smallest of our ducks, about the size of a pigeon. The male is beautifully colored with a dark, reddish-brown head, a green streak over the eye, and a vertical white stripe on the side. The female is primarily brown. The speculum shows green in both sexes. Green-winged teal fly swiftly, often in small, tight flocks. Drakes whistle and have a tittering call; hens sound a faint *quack*.

Green-winged teal prefer small and shallow, but permanent, freshwater ponds, with thick cover nearby. They feed on small seeds of grasses, bulrushes and smartweeds, and on the stems and leaves of pondweeds. They also eat

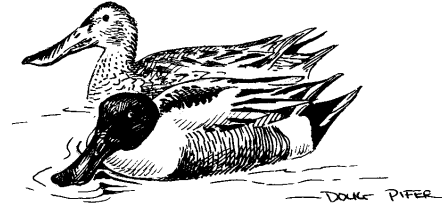
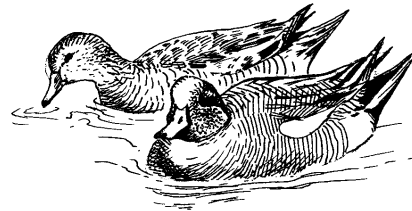
Blue-Winged
Teals



Green-
Winged Teals



American
Wigeons



Shovellers

tiny mollusks, snails and other crustaceans.

A few green-winged teal may be found nesting in Pennsylvania, although the duck's primary breeding range is farther north, across Canada, the northwestern United States, and Alaska. Courting birds engage in much whistling and posturing. Females hide their nests in dense patches of shrubs and weeds, or in tall grass at the edge of a lake or slough. They lay 8 to 10 eggs and incubate them 21 to 23 days; they vigorously defend their nest. Some green-winged teal occasionally winter in Pennsylvania, but most go farther south.

Blue-winged Teal — Length, 14 to 16 inches; average weight, $\frac{3}{4}$ to 1 pound. The drake has a brown body and a slate-gray head; in front of the eyes is a distinctive white crescent. The hen is primarily brown. Both sexes have a blue patch on the fore-wing and a green speculum, but patches are more prominent on the males. Blue-winged teal are shy, common waterfowl, found on ponds, marshes and protected bays, often with other puddle ducks. Their small, compact flocks fly swiftly, often low over the marsh, twisting and dodging around trees and bushes; the birds sound a twittering flight call. Additional calls: drakes have a whistling *tseet tseet tseet*, and hens a soft *quack*. Blue-wings are our earliest migrants; they head south in late August and September.

Food includes seeds and vegetation of aquatic plants, especially pondweeds, widgeon grass, duckweed and millet. They often feed near green-winged teal, the blue-wings consuming more animal matter.

Blue-winged teal occasionally nest in Pennsylvania, in borders of freshwater sloughs, swamps, ponds, and marshes. They lay 10 to 13 eggs in a basket-like nest built on dry ground. Surrounding vegetation usually arches over the nest, concealing it. Incubation is 23 to 24 days.

The blue-winged teal is a familiar, common duck of inland North America, although its numbers have been reduced through cultivation and habitat destruction in its primary breeding range, the prairie pothole region in mid North America.

American Wigeon — Length, 18 to 23 inches; average weight, $1\frac{1}{2}$ to 2 pounds. Also called "baldpate." The

male has a cinnamon-red neck and head, with a white stripe from the forehead to the middle of the crown and an iridescent green patch coming back from the eye; the body is pinkish-brown, the speculum blackish with a hint of green. The female's coloration is similar, but duller. The species can best be identified in flight by the white belly and fore-wings. Wigeons are wary birds, quickly reacting to potential threats and disturbances; they fly swiftly in compact flocks, wheeling and turning in unison. Males have a 3-syllable whistle with the middle note the loudest; hens utter a loud *koow* and a lower *qua-awk*.

Wigeons feed on aquatic plants, sometimes coming ashore for shoots of grains and grasses. They breed in the northwestern United States, Canada and Alaska, nesting in dry, sedge-lined meadows around lakes and sloughs. The 7 to 9 eggs are incubated about 23 days. Wigeons migrate through Pennsylvania in September and October. Some occasionally winter here, but most go to the southern states and farther south.

Northern Shoveler — Length, 17 to 22 inches; weight, about $1\frac{1}{2}$ pounds; size similar to the mallard, for which it is often mistaken. Also called "spoonbill" for its long, broad bill. The male has a green head, white breast and chestnut sides. The female is a mottled brown. The best field marks are the outsize bill, held downward as the bird rides in the water; and, in flight, blue upper-wing and white under-wing coloration. Females have a typical quacking call, males a *took-took*. Shovelers usually travel in small flocks of 5 to 10 birds.

Food: invertebrates (caddis fly larvae, dragonfly nymphs, beetles, bugs), duckweeds and seeds of pondweeds and bulrushes. In deep water, shovelers apparently feed on surface plankton, taking in a steady stream of water at the tip of the bill and expelling it at the base, straining out microscopic plants.

Shovelers breed in the northwestern United States, Canada and Alaska. Females nest in grassy cover, sometimes well away from water. The 10 eggs hatch in 3 to 4 weeks. Shovelers pass through Pennsylvania in March and April, and again in September and October. They winter along the southern United States coast and in western states and Central America.

Wildlife Notes

Allegheny Woodrat	Opossum
Bats	Otter
Beaver	Owls
Black Bear	Porcupine
Blackbirds, Orioles, Cowbird and Starling	Puddle Ducks
Blue Jay	Raccoon
Bobcat	Rails, Moorhen and Coot
Bobwhite Quail	Raptors
Canada Goose	Ring-necked Pheasant
Chickadees, Nuthatches, Titmouse and Brown Creeper	Ruby-throated Hummingbird
Chimney Swift, Purple Martin and Swallows	Ruffed Grouse
Chipmunk	Shrews
Common Nighthawk and Whip-Poor-Will	Snowshoe Hare
Cottontail Rabbit	Sparrows and Towhee
Coyote	Squirrels
Crows and Ravens	Striped Skunk
Diving Ducks	Tanagers
Doves	Thrushes
Eagles and Ospreys	Vireos
Elk	Vultures
Finches and House Sparrow	Weasels
Fisher	White-tailed Deer
Flycatchers	Wild Turkey
Foxes (Red & Gray)	Woodchuck
Gray Catbird, Northern Mockingbird and Brown Thrasher	Woodcock
Hérons	Wood Duck
Kingfisher	Woodpecker
Mallard	Wood Warblers
Mice and Voles	Wrens
Minks & Muskrats	
Northern Cardinal, Grosbeaks, Indigo Bunting and Dickcissel	

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Wildlife Note — 9
LDR0103

Raccoon

by Chuck Fergus

The raccoon is a medium-size woods mammal with the scientific name *Procyon lotor*. *Procyon* means “before dog,” implying the raccoon is less advanced than the dog from an evolutionary standpoint; *lotor* refers to the species’ habit of dunking food in water before consumption. The common names “raccoon” and “coon” are anglicized versions of the Indian word “arocoun.” It’s fitting that the common names evolved from a Native American word, as the raccoon is strictly a New World animal, found in North and Central America.

As with many wildlife species, we view the raccoon with mixed emotions. Some raccoons are destructive, damaging crops and gardens, and raiding nests of domestic birds. They’re valuable in many ways, too: a prime pelt brings good money on the fur market, and hunting raccoons with hounds is an exciting sport with a tradition as old as the hills. But in the end, the true value of any life form cannot be measured in man’s terms. Raccoons have worth simply because they are one of the many fascinating and interlocking segments of nature.

Biology

Raccoons range in size from 28 to 38 inches, which includes a 10-inch tail, and weigh 10 to 30 pounds. Males are generally larger and heavier than females. Records exist of raccoons weighing up to 40 pounds, but individuals this heavy are extremely rare in the wild.

A raccoon’s fur is long, soft and colored a grizzled black-brown. The bushy tail is marked with alternating rings of light and dark fur. Broad cheeks, a long slender muzzle, erect, rounded ears and a black strip or mask

across the cheeks and eyes give the raccoon a masked bandit-like appearance. Albinism (a lack of pigment producing a white individual with pink eyes) and melanism (which produces a totally black animal) occur infrequently. The



fur on a raccoon’s feet is light gray, and the soles of the paws are hairless. Raccoons shed in April, producing coats with thinner, lighter guard hairs; in autumn, heavier fur fills in. Usually by late November the winter coat has replaced the shorter summer fur. At that time the pelt becomes prime.

Raccoons are found throughout Pennsylvania, often near water — lakes, streams, rivers — but also on ridges and in suburban areas. They adapt well to people and human activities; some raccoons live in cities, where they den in storm drains and attics and raid garbage cans and pet dishes.

Raccoons are omnivorous. This means they eat both vegetable and animal matter, including wild cherries and grapes, raspberries, blackberries, persimmons, apples, beechnuts, acorns, melons, corn, grass, leaves, earthworms, crickets, grasshoppers, beetles, grubs, fish, frogs, crayfish, mice, carrion, eggs, etc.

Raccoons have excellent senses of hearing, sight and smell. They also possess an acute sense of touch in their forefeet, enabling them to catch fish and other small, quick prey. Long, sharp claws anchor slippery food items. No one knows exactly why raccoons occasionally dunk food taken in or near water before eating it. Many naturalists believe raccoons derive some information from handling the food underwater, which may cause them to accept or reject it.

Raccoons are adept climbers and, being nocturnal, they spend most of their daylight hours in trees. On warm, bright days they like to sun themselves while lying flat on horizontal limbs, in squirrel leaf nests or curled up in the crotches of trees. Then at night, they descend in search of food. They travel, feed and hunt almost exclusively on the ground. Most raccoons have central home dens as well as others scattered about their feeding ranges. Adult home ranges are about a mile in diameter, greater when food is scarce. An ideal den or nesting site is a hollow in a large tree trunk or limb, but raccoons also use old woodchuck burrows, caves, rock crevices and abandoned farm buildings.

Raccoons have short, stout builds. Like bears, they are plantigrade (flat-footed), walking on the sole of the foot with the heel touching the ground. They’re relatively slow runners but fierce fighters — especially females with young. Men and dogs are the adults’ main enemies, al-

though owls, foxes and bobcats may take young that stray from their mothers' protection. Raccoons are strong swimmers.

A raccoon makes a variety of sounds, including barks, hisses, a wailing tremolo, a *churr-churr* noise often given while the animal is feeding, and a piercing scream of alarm or fear.

By late autumn, raccoons have eaten enough to produce a heavy layer of fat that helps sustain them until spring, although they eat whatever food they can find in winter. They do not store food. Unlike woodchucks, raccoons are not true hibernators; they den up and sleep soundly when temperatures fall below about 25 degrees, but emerge at different times throughout the winter during warm spells. They are considerably leaner by spring, having burned up much fat.

Breeding takes place in January or February. Following a 2-month gestation period, young are born in March and April. Usual litter size is 3 to 5 young, with 4 the average. Cubs weigh about three ounces at birth, are covered with yellow-gray fur and have faintly banded tails. After about 19 days their eyes open, and when four weeks old they begin to accompany the female on short feeding forays. Weaning starts at about eight weeks; by the time they're three or four months old, cub raccoons are large and independent enough to be on their own.

The male usually stays with the female after mating and until babies are born, and may help rear the young. By the time the young mature, however, the father has usually gone off on his own.

Many family groups — mother and offspring — stay together through the young raccoons' first winter. Most yearling females breed at this time, but males of the same age probably do not breed for another year. If for some reason a female doesn't breed in winter, she may become receptive later in the spring and bear young in the summer. Small raccoons found in the fall are the result of this late breeding. By late fall, young raccoons follow their mother away from the den nightly in search of food.

In spring, juveniles disperse from the areas in which they were born. Young raccoons may move only a mile or two or may travel long distances. Records exist of young males apparently dispersing up to 150 miles, although movement of this magnitude is unusual.

Raccoons exhibit some social hierarchy; most dominant are older males and females with young. However, individuals do not defend fixed territories or ranges against other raccoons.

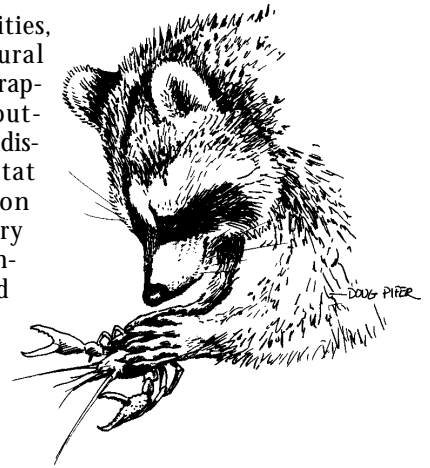
Captive raccoons have lived up to 18 years, but their life expectancy in the wild is probably about 10 years. Important mortality factors are lack of food in a hard, long-lasting winter, parasitism, hunting, trapping and disease. Many raccoons are also killed on highways.

Population

Although it experiences occasional declines, Pennsylvania's raccoon population is stable. Nationwide, raccoons occur in all of the lower 48 states and into Central America, but they're not found in the higher reaches of the Rocky Mountains or some of the Western deserts.

Local populations may fluctuate because of severe

weather, food scarcities, development of rural land, hunting and trapping pressures, outbreaks of rabies and distemper, and habitat changes. Population concentrations vary with habitat; researchers have estimated one raccoon per 0.63 acres of excellent habitat and one raccoon per two acres of good habitat.



Raccoons become more susceptible to disease if they overpopulate an area, because they'll encounter one another more often. However, as long as fur prices provide an impetus for trappers to harvest raccoons, disease will only minimally impact populations.

Habitat

Raccoons are adaptable, and many types of terrain provide suitable areas for them to live. As a rule, they prefer forested areas offering plenty of den sites. They favor hardwood over coniferous forests, because hardwoods provide more food (nuts, fruits) and are more apt to develop cavities and hollow limbs suitable for shelter. Swamps and fertile bottomlands are good habitat; raccoons often thrive near water courses, where good hunting opportunities exist. A raccoon will wade up a small spring run in search of crayfish, aquatic insects, minnows and other food.

The Game Commission has never had to improve habitat specifically for the raccoon because the species manages well on its own. In managing forests on state game lands, however, the Commission tries to protect mature hardwoods, which are used as den trees by raccoons and many other wildlife species.

A varied habitat — trees of different ages and types, brush, herbaceous vegetation — is ideal because it provides food during all seasons. In general, habitat improvement for turkeys, squirrels or deer also benefits raccoons. Grassy openings are excellent sources for insect food. Food-producers such as grapevines, blackberry, raspberry and greenbrier patches, black cherry trees, oaks and beeches should be encouraged and maintained. Beaver dams benefit raccoons — and many other wildlife species — by producing plentiful aquatic food.

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Wildlife Note — 10
LDR0603

Raptors

by Chuck Fergus

When the night sky brightens in the east, owls retire to hollow trees and shady thickets. Then enter the hawks; during the day, these fascinating birds continue nature's winnowing process — predation.

This wildlife note covers 11 Pennsylvania hawks: the northern goshawk, sharp-shinned, Cooper's, red-tailed, red-shouldered, broad-winged and rough-legged hawks, northern harrier, peregrine falcon, merlin and American kestrel.

Hawks are quick, efficient predators. They have sharp talons and strong hooked beaks; bills and feet vary in size and shape according to the species' prey preferences. Eyesight of some hawks is as sharp as that of a human looking through eight-power binoculars. The eyes of hawks are located in the front of the head; this gives the birds binocular vision and enables them to judge distance. Their hearing is acute, but their sense of smell — if they have one — is poor.

While hunting, hawks may soar high, sit and watch from a perch or strike their prey in midair. When a hawk drops to attack, tendons spread its feet; upon impact, the toes automatically clench and drive the talons deep. A snap from the hooked bill can crush a prey's skull or break its back. Hawks "mantle" prey after killing, crouching and spreading their wings to form a shield that hides it from other predators.



Kestrel

The bird may eat on the ground or carry its kill to a feeding spot, often a fencepost or tree limb, where it plucks its prey and tears the meat apart with its beak. Unlike an owl, a hawk does not swallow its food whole or in large chunks. Hours after eating, a hawk will regurgitate a pellet containing any feathers, fur or small bones swallowed

accidentally.

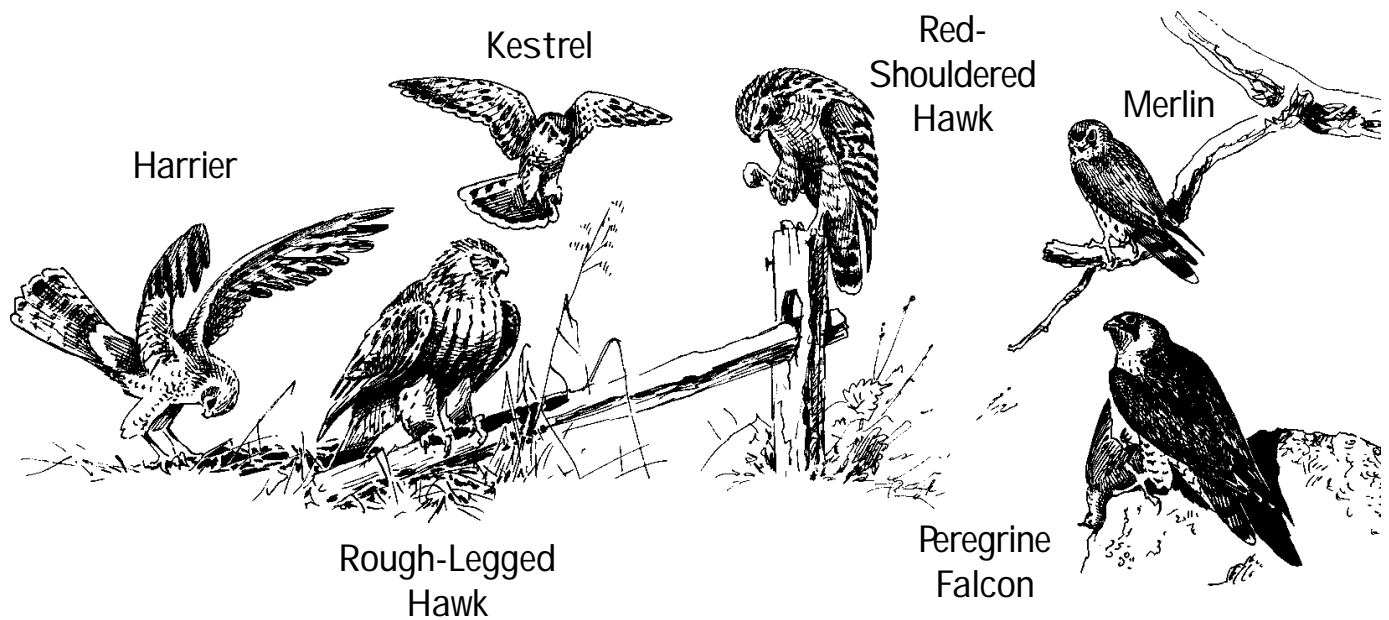
Identifying hawks can be difficult. While males and females of the same species are generally of similar colors, individual variation often occurs within the species. Juveniles are especially hard to identify. Adult females are generally larger than their mates — in some cases, nearly twice as heavy. Our hawks have yellow feet and a yellow cere (area at the base of the bill).

Many hawks mate for life. They nest high above the ground on sturdy limbs, in the crotches of trees or on rock ledges. Generally, nests are loosely built of sticks and twigs; some are lined with down and other feathers. A mated pair will either remodel an old nest or build a new one, occasionally starting on top of a squirrel or crow nest. The female may begin incubation before the last egg is laid, resulting in young of different sizes in the same brood. The female does most of the incubating and is supplied with food by the male.

Newly hatched hawks are altricial — helpless, unfeathered and covered with down, but they grow rapidly. After about two weeks, when the young no longer require constant brooding, the female joins the male in hunting to feed them. The young soon learn to tear meat apart and feed themselves. After five or six weeks, when flight feathers grow in, they begin taking short flights; several weeks later, the fledglings start to hunt.

Hawks help control insect, rodent and small bird populations. They're a natural predatory force that improves a prey species by making it develop alertness, speed and other survival attributes, and by weeding out unfit individuals. Hawks are also environmental indicators. If pollutants accumulate in natural food chains, avian predators are usually the first wild species to show ill effects: failure to reproduce, thin egg shells and nesting failure, or outright death through poisoning. Heavy metals and chlorine-based pesticides such as (the now banned) DDT, aldrin, dieldrin and heptachlor reduced hawks numbers.

Many hawks fly south each autumn. The species migrating in greatest numbers are often those that cannot find adequate food supplies in winter. Some hawks breeding in Pennsylvania winter as far south as Peru; during migration, a hawk can cover several hundred miles daily, depending on weather and wind conditions. In our state,



many migrating birds follow ridges paralleling the Allegheny Plateau, climbing high on thermals that rise along these ridges. Hawk Mountain, near Kempton in southeastern Pennsylvania, is a famous spot to observe migrating hawks.

For a long time, birds of prey were often labeled “chicken hawks” and shot on sight. Research has shown that while hawks do kill some poultry and game, in most cases they do not drastically affect poultry operations or game populations. Today, many people get much enjoyment from observing hawks. In Pennsylvania, hawks are protected by both federal and state laws.

The 11 birds of prey covered in this note fall into four basic types: accipiters, buteos and harriers — often lumped together under the term “hawk” — and falcons. Accipiters (goshawk, sharp-shinned hawk, Cooper’s hawk) have small heads, long tails and short well-rounded wings. They fly with rapid wingbeats followed by a long glide. Extremely maneuverable, they are well-suited to the thick forest areas they inhabit. Accipiters feed largely on other birds.

Buteos (red-tailed, red-shouldered, broad-winged and rough-legged hawks) have stocky bodies, broad rounded wings and short fanned tails. Most are brown in color; young are similar to adults, but in most cases are streaked lengthwise below, rather than barred. Buteos perch in open country or soar in wide circles when hunting; small mammals are their main prey.

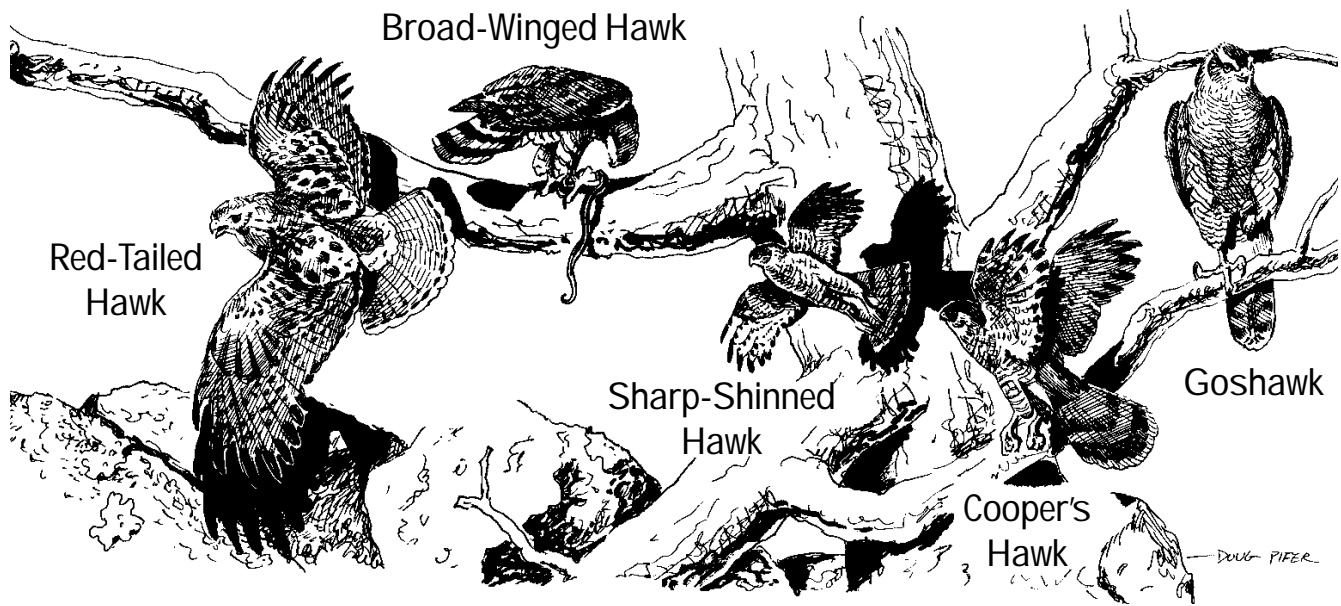
The marsh hawk is the only harrier found in North America. It’s long-legged, with long narrow wings and a long tail. It soars with wingtips held perceptibly above the horizontal, much like a turkey vulture, quartering open country in search of prey.

Falcons (peregrine, merlin, kestrel) have large heads, broad shoulders, long pointed wings and a long tail. They are streamlined and built for speed, flying in a direct path with deep rapid wingbeats. They do not usually soar, although the kestrel sometimes hovers with rapid wing strokes. In hunting, the peregrine and merlin often fly

above smaller birds and then dive to the attack, striking prey while in full flight.

Northern Goshawk (*Accipiter gentilis*) — Length, 20 to 26 inches; wingspread, 40 to 47 inches; weight, 1½ to 3½ pounds. Both immatures and adults have a prominent white line over each eye; the eyes of adults are bright red. Adults are blue-gray above and white below, with light barring on the breast. Immatures are brown above and creamy white below, with heavily streaked undersides. The largest of our accipiters, goshawks are seen in greatest numbers in winter, when food scarcities force many south. Also called “blue darters,” goshawks are swift, maneuverable and relentless, sometimes pursuing prey — birds and small mammals — through thick underbrush on foot. Goshawks breed in wooded areas and prefer wild territory, such as the mountainous areas of northern Pennsylvania. They nest up to 75 feet above the ground in trees, building bulky nests (3 to 4 feet in diameter). A pair often uses the same nest year after year. Eggs: 3 to 4, off-white and usually unmarked, incubated 36 to 38 days by the female. Goshawks defend their nests fiercely; voice is a harsh ca ca ca around the nest.

Sharp-Shinned Hawk (*Accipiter striatus*) — Length, 10 to 14 inches; wingspread, 20 to 27 inches; weight, 5 to 9 ounces. Identification of this species is often difficult, as large female sharpshins are nearly the size of small male Cooper’s hawks, which they closely resemble. Adults have red eyes and are blue-gray above, with light rufous barring on the breast. Immatures are brown above, heavily streaked below. These are small hawks with short rounded wings and a long square-tipped tail. Sharpshins feed almost exclusively on small birds such as sparrows, warblers, vireos, etc. They fly and sail rapidly through the woods or hunt from a perch. Favored habitat is woodland, preferably coniferous, and woods edges. Sharpshins breed throughout the eastern United States, south to Alabama. They prefer to nest in conifers, about 30 to 35



feet up, usually building a new nest each year. Eggs: 4 to 5 white or bluish with brown blotches. Incubation is by both sexes, mostly by the female, and takes 21 to 24 days. Around the nest, adults make a *kek kek kek* sound; in flight a shrill scream.

Cooper's Hawk (*Accipiter cooperii*) — Length, 14 to 20 inches; wingspread, 27 to 36 inches; weight, 10 to 20 ounces (slightly smaller than a crow). Adults look like large sharp-shinned hawks — red eyes, blue-gray back and a rusty breast, except the Cooper's have rounded tails and the sharpshins have square-tipped tails. Named in 1828 after William Cooper, a New York naturalist, Cooper's hawks prey mainly on birds the size of robins and jays. While hunting, they prefer to perch and wait for prey. Favored habitat is woodland. Cooper's hawks breed throughout most of the eastern United States; they nest in trees 20 to 60 feet up. Eggs: 4 to 5, white, incubated by both sexes but mainly by the female for about one month. Woods where Cooper's hawks nest may remain heavily populated with songbirds, as these hawks hunt away from their nest area. Call is similar to that of the sharp-shinned.

Red-Tailed Hawk (*Buteo jamaicensis*) — Length, 19 to 25 inches; wingspread, 46 to 58 inches; weight, 2½ to 4 pounds. Upper plumage is dark brown, and the light undersides have a belly band of dark streaking. In adults, the upper side of the tail is rusty red; in young, dark gray. Redtails inhabit deciduous woods. Primarily soaring birds, they prey on mice, birds, rabbits, red and gray squirrels, chipmunks. Voice is a rasping *keer-r-r-r*, slurring downward. Redtails breed throughout the East. They nest in trees 35 to 90 feet up, both sexes helping to build a stick-and-twigs nest lined with bark or green sprigs. Eggs: usually two, white and unmarked or with brown splotches. Incubation is by the female, for one month.

Red-Shouldered Hawk (*Buteo lineatus*) — Length, 18 to 24 inches; wingspread, 33 to 50 inches, weight 2 to 3

pounds. Adults are colorful birds: dark brown above with chestnut-red shoulders, rich reddish-brown and white below tail strongly barred with black and white. Many individuals have a translucent area or "window" near the wingtips, visible when they are airborne. These buteos are shy and hard to approach; they favor damp woods, river bottomlands and swamps. They hunt from an exposed perch offering a wide field of view or by circling high overhead, and prey on rodents, birds, frogs and snakes. Voice is a piercing whistled *kee-yer*, which blue jays often mimic. Red-shouldered hawks nest 20 to 60 feet above the ground in trees. Eggs: 2 to 4, usually three dull white with brown markings; incubation is by both sexes and takes about 28 days.

Broad-Winged Hawk (*Buteo platypterus*) — Length, 13 to 19 inches; wingspread, 32 to 39 inches; weight, 13 to 20 ounces. This small buteo is easily recognized by its heavily banded tail, with two dark and two light bands. Upper plumage is dark gray-brown; underparts are white, heavily streaked with brown. The broad-winged is a hawk of the forests, preying on snakes, amphibians, insects and small mammals. It is our most common hawk, fairly unwarly and approachable. During migration, broadwings congregate in "kettles" of rising air, which they use to gain height. They winter in South America. Voice is a high whistled *p-we-e-e-e*. Broadwings breed mainly in deciduous forests and construct their small nests 24 to 40 feet up in trees. Eggs: 2 to 3, dull creamy white with brown markings. Incubation (about 30 days) is mostly by the female.

Rough-Legged Hawk (*Buteo lagopus*) — Length, 19 to 24 inches; wingspread, 50 to 56 inches; weight, two pounds. This species exhibits two color phases with wide individual variation in between. Light phase: upper side light buff to white, streaked with brown; underparts white, with a brown "wrist mark" partway out the wing and a brown band across the abdomen. Dark phase: black or

sooty brown, with white at the base of the underside of the tail. Feet are feathered to the toes, hence the name "rough-legged." This large *buteo* often hovers over fields, beating its broad wings in short rapid strokes much like a kingfisher or a kestrel. Its small sharp-taloned feet are adapted to kill rodents — meadow mice, voles, gophers. Rough-legged hawks often hunt at dusk. They nest in the Arctic and northern Canada; like goshawks, most rough-leggeds come to Pennsylvania in the winter, when deep snow covers rodents on the northern feeding grounds and other prey birds have migrated south. They dwell mainly in open country, fields and marshes.

Northern Harrier (*Circus cyaneus*) — Length, 18 to 24 inches; wingspread, 40 to 54 inches; weight, 12 to 16 ounces. Harriers, also known as marsh hawks, have a white rump patch and a ruff of feathers around the face, much like the facial disks of owls. Males are pale bluish-gray above, white below; the tail, gray with dark bands. Females are brown above, light brown with dark streaks below; tail is barred with black and buff. Immatures resemble females. Marsh hawks inhabit fresh- or saltwater marshes, wet meadows, bogs and flat open farmland. They prey on mice, insects, small birds and rabbits. The species tends to congregate in winter. Voice is a weak nasal pee, pee, pee. Marsh hawks nest on or near the ground, sometimes in fields and occasionally on a branch over the water. Nests are made of sticks, straw, grasses and are lined with feathers. Eggs: 4 to 6, usually five, oval, dull white to pale blue. Incubation is mostly by the female and takes about 24 days.

Peregrine Falcon (*Falco peregrinus*) — Length, 15 to 20 inches; wingspread, 38 to 46 inches; weight, 1½ to 2½ pounds. Peregrines, also known as duck hawks, are slate blue, barred darkly above, with a black cap and "moustache" mark below the eye. Young birds are browner and heavily streaked below. Peregrines have long pointed wings and fly with quick rowing wingbeats similar to those of a pigeon. In attacking prey — ducks, pigeons, blue jays, flickers and other birds, a peregrine folds its wings close to its body and dives at speeds sometimes more than 175 mph; it strikes with its large knobbed feet, usually breaking the victim's back and killing it outright. When the

prey falls to the ground, the falcon picks it up and carries it to a convenient perch to be eaten. The peregrine was near extinction and is on the federal Endangered Species List. Persistent highly toxic pesticides, which affect peregrine reproduction, nearly eliminated the bird in the eastern United States. Cornell University ornithologists pioneered the restoration of this species, raising peregrines from captive parents and releasing the young birds in suitable habitat. Recovery efforts restored the peregrine to the East in the 1980s. They now nest on city buildings and bridges in Philadelphia, Pittsburgh and Harrisburg. Eggs: 2 to 4, creamy white covered with rich brown markings; 33- to 35-day incubation period. Voice is a repeated we-hew or a rapid rasping cack cack cack.

Merlin (*Falco columbarius*) — Length, 10 to 13½ inches; wingspread, 24 to 26 inches; weight, 6 to 8 ounces (size of a blue jay). Merlins look like miniature peregrines, with males blue-gray above and banded black on the tail. Females and young birds are dusky brown above, white below. The name "pigeon hawk" comes from this falcon's resemblance to a pigeon in both flight and posture. Voice is a rasping chatter. Merlins prey mainly on birds, but also take small mammals and insects. They favor open woods or heavy timber in wild areas. They nest about 35 to 60 feet up on ledges, in natural cavities or in old nests of other birds. Eggs: 4 to 5 whitish, almost covered by fine brown marks. Incubation takes 30 days and is by the female.

American Kestrel (*Falco sparverius*) — Length, 9 to 12 inches; wingspread, 20 to 24 inches; weight, 34 ounces (robin size). Kestrels, also known as sparrow hawks, have rusty red head caps, backs and tails, and a black and white face pattern. Males have blue-gray wings, females brown wings. The kestrel is one of our smallest raptor and our most common falcon. Its flight is erratic and buoyant, and it often perches on telephone poles or hovers in one spot on rapidly beating wings. Voice is a shrill killy killy killy. In summer, kestrels take insects and occasionally birds; in winter, they prey mainly on mice. They inhabit open woods, orchards and fields, and breed throughout the eastern United States. Kestrels nest in tree cavities, abandoned woodpecker holes and old buildings, and at times even nest boxes. Eggs: 3 to 5, whitish, dotted with brown; the female incubates them 29 to 30 days.



Red-Tailed
Hawk

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Wildlife Note — 11
LDR0103

River Otter

by Chuck Fergus

The river otter, *Lutra canadensis*, is an elusive aquatic mammal. It belongs to the mustelid or weasel family and is closely related to the sea otter, mink, badger, wolverine and weasels.

Otters slide on ice or snow, shoot down slick muddy banks into creeks, play with food, sticks and stones, and wrestle each other. Few people are lucky enough to see otters in the wild, but those who do rarely forget the experience.

Biology

A mature male otter weighs 10 to 25 pounds and is 30 to 40 inches in length, plus a 12- to 15-inch tail. Females are slightly smaller. An otter is muscular, streamlined and solidly built, somewhat like a dachshund; height at the shoulder is about 10 inches. An otter's tail is long and tapered, thickest where it joins the body and furred its entire length. The face is broad, and the eyes protrude slightly.

Otter fur is a rich dark brown, lighter on the underparts; the throat and chin are grayish, the nose black and bare. Two fur layers — short dense underfur and longer guard hairs — combine with a subcutaneous layer of fat to insulate the body. In autumn, the normally thick fur grows in even thicker for extra cold resistance. All four feet are wide and webbed between the toes, although the hind pair are used more in swimming than the front pair.

Otters obtain most of their food from the water. Fish are favorites: minnows, sunfish, suckers, carp and trout. Other foods are frogs, turtles, snails, mussels (an otter crunches the shells with its teeth), crayfish, snakes and snake eggs, worms, insects, aquatic plants, roots and, on occasion, muskrats.

An otter's hearing is acute, its eyesight adequate above water and superb below. It has a keen sense of smell and a set of long, stiff, sensitive whiskers just behind and below the nose; these serve as sense organs when the animal is searching for food in murky or turbulent water.

An otter is a fast, graceful swimmer, probably the most

adept in water of all the land mammals. It can travel underwater a quarter-mile without coming up for air, dive up to 50 feet and, if necessary, stay submerged up to four minutes. While underwater, valve-like structures seal an otter's ears and nose, and its pulse rate drops, slowing blood and oxygen circulation, making long submersion possible.

Underwater locomotion is mainly by body movement, with the feet and tail used for steering; propulsion comes from up-and-down body flexing, as opposed to the side-to-side movement of a swimming fish. An otter's top swimming speed is about seven miles per hour.

Otters den on the edges of lakes, rivers or streams, or occasionally on islands or patches of high ground in marshes. Dens may be excavations under tree roots or rock piles, abandoned beaver, muskrat or woodchuck burrows, or unused beaver lodges. A typical den has an underwater entrance hole, a living space above water level and several air or exit-entry holes to dry ground.

Otters mature sexually by two years of age. They breed sometime between January and May, mating taking place in the water. As with many other mustelids, otters have delayed implantation. This means that after fertilization, eggs remain dormant in the female's uterus until the following December, January or February, when they attach to the uterine wall and start to develop. Approximately two months later, from February to April, one to five

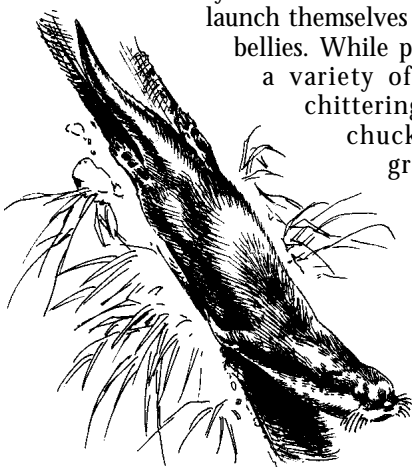


(most often two or three) young are born. Females usually have their first litter at age three.

Pups weigh 4 to 5 ounces and are blind and toothless at birth. They do not open their eyes for five weeks, and their mother keeps them in the den until they are three or four months old. The female breeds shortly after giving birth, but she will not allow a male near her young for several months. Males are polygamous.

When a young otter emerges from the den, its mother must teach it to swim. First she carries or pushes the pup into the water; then she submerges, remaining nearby as the pup tries to swim and letting it climb onto her back when it tires. After several such lessons, young otters begin to enter the water on their own and eventually play, hunt and feed in it. By autumn, they are nearly adult size. They may remain with their mother until she is ready to bear another litter.

Curious and playful, otters romp and wrestle with each other or play by themselves, even as adults. On snow, they take three or four running steps,



launch themselves and slide on their bellies. While playing, they make a variety of sounds: chirps, chattering noises and low chucklings and grumbings. A

scream is the danger call. Otters are mainly nocturnal but occasionally venture out during the day.

Otter predation isn't common as few of our predators can

catch an otter and females go to great lengths to protect their young. Too swift and agile to be caught in the water, otters are able fighters if cornered on land. They have tremendous strength, reflexes and endurance, sturdy teeth and powerful muscles.

Otters do not store food for winter, nor do they hibernate. If lakes or rivers freeze, they swim under the ice; they breathe on the surface of open water, in their dens or from air pockets lodged against the underside of the ice. In winter, they spend much time in the water, which is often warmer than the air. Otters are more sedentary in winter than in summer — especially during extreme cold spells — although winter food shortages may force individuals to cover as much as 50 miles of stream over the season.

Otters groom themselves frequently and are in the water much of the time, so external parasites are not too common; however, lice have been found on some pelts. Internal parasites include liver flukes and stomach and intestinal worms. An otter's lifespan is 10 to 20 years.

Population

Various types of otters are found throughout the world, except in Australia, New Zealand, the extreme arctic and

antarctic regions, and desert areas. In North America, otter populations remain large in the lake region of eastern Canada, Florida, Louisiana, the Carolinas, Alaska, the Pacific Northwest, Michigan and Wisconsin.

In Pennsylvania, the species has been protected since 1952, with no hunting or trapping allowed. Because otters are secretive and nocturnal, it's hard to estimate the population. Many of the state's otters are found in our northeastern counties, but they can be found in every major river basin in the state.

Both New York and Maryland have substantial otter populations. Their numbers are fairly stable, and trapping is permitted in both states. This situation is brought about by the large amounts of suitable aquatic habitat — numerous lakes in New York, and the Chesapeake and seaboard areas of Maryland.

The Game Commission, Wild Resource Conservation Fund, Pennsylvania State University and other partners have funded otter restocking efforts in the state since the early 1980s, and related research and management efforts are ongoing.

Water pollution — strip mine run-off, industrial wastes, sewage — made many Pennsylvania streams, lakes and rivers unfit for aquatic life, otters included. But much progress has been made in cleaning up many of the state's polluted waterways. A direct benefit of that is the return of river otters.

Habitat

Clean water supporting fish and other aquatic life is the foundation of good otter habitat. Although otters have been sighted miles from water — usually during the breeding season — they were probably en route to another water source.

Otters are found in extremely varied habitat in North America, including high Rocky Mountain lakes, spruce and birch forests in the North, marshes and swamps in the South, and major river basins.

While otters sometimes live near towns and cities, they seem to prefer wilder territory. Water quality, more than any other factor, will determine where otters will live in the future. Right now, the future's bright as fish and other aquatic life are prospering in many of our once-polluted waterways. Moreover, tough anti-pollution laws now safeguard these waters from returning to the crippled state they were in not too long ago. For the otter's sake, that's good news and should translate into continuing range expansion for some time to come.

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Wildlife Note — 2
LDR0103

Ruffed Grouse

by Chuck Fergus



The ruffed grouse, *Bonasa umbellus*, has been Pennsylvania's official state bird since 1931, and its beauty is admired by hunter and nonhunter alike. Grouse are still fairly plentiful in many parts of Penn's Woods, although they're not as abundant today as they were a hundred years ago. Where mature forests dominate the landscape, grouse, while present, are limited. But wherever brushy conditions are found, there's a good possibility grouse can be found there, too.

Grouse are gallinaceous birds and are related to quail, turkeys, pheasants and ptarmigan. The ruffed grouse is found throughout much of the northern part of our continent in areas of suitable habitat.

Biology

A grouse weighs about 1½ pounds, body length is 15½ to 19 inches, and wingspread is 22 to 25 inches. The bird's plumage is rich brown sprinkled with white and black above, and white with horizontal dark brown bars on the breast and undersides. The tail is brown and has a wide, black band between two narrower grayish bands. The name "ruffed" comes from a ruff of iridescent black feathers that almost completely encircles the neck.

Two interesting color phases occur infrequently. "Silvertailed" birds have gray instead of brown in the tail; "red-ruffs," even rarer than the silver-tails, have rust-colored feathers with chocolate-brown ruffs and a dark brown — rather than black — tail band.

Males (cocks) differ from females (hens) in several ways. They weigh a little more than females, and have much more prominent ruffs, which can be fluffed up for a courtship display. The hen has a shorter tail, and her black tail band is generally broken in the center, while the cock's band is usually continuous. Grouse molt once each year. Adults molt from July into September and may have difficulty flying when many flight feathers have dropped and replacements have not fully developed. Immature birds molt in August and September, when adult plumage replaces juvenile feathering.

Grouse are found throughout Pennsylvania in suitable habitat and are year-round residents. Individuals rarely range more than a few hundred yards a day unless pressed by predators or hunters; in fact, the same bird may be

flushed from the same area in the woods several days in a row.

Grouse eat many types of food. In the summer, they consume insects (which are rich in protein), blackberries, blueberries and other wild fruits. In fall, when insects are scarce, their diet is almost exclusively plant foods including small acorns, beechnuts, cherries, barberries, wild grapes, apples, hawthorn and dogwood fruits, and various buds and leaves. Buds form the basis of the grouse's winter diet: aspen, birch, beech, maple, cherry and apple buds are favored. Ferns, green leaves and other evergreen foods are eaten until food becomes more plentiful in the spring.

Like most birds, grouse have keen eyesight and hearing. At one time, they were not nearly as wary as they are today; reputedly, early settlers killed them with sticks and stones. Today you may surprise a grouse bathing in the dust on a back road, in a sandy bare spot on the forest floor, or in the debris around a rotting stump. Dust bathing may stimulate feather growth in young grouse, maintain adult plumage or rid birds of external parasites.

Grouse seek shelter beneath conifers during stormy weather, and they roost in conifers and hardwoods. They may spend winter nights beneath the snow, sometimes flying directly into a soft snowbank at dusk. Grouse are not especially gregarious, although groups of birds are sometimes found together in the fall. These are usually a hen and her offspring of that year. During winter, a grouse's feet develop snowshoe-like properties through the growth of a horny fringe around the toes.

Although its take-off is thunderous and powerful, a grouse cannot fly long distances. Its top flight speed is about 20 m.p.h. After take-off, it flies rapidly and then locks its wings and glides to safer territory, usually traveling less than 100 yards. During mating season — March and April — male grouse attract females by drumming. With tail fanned, the male stands on a large, prominent log or rock and beats the air sharply with his wings. The rush of air created by his wingbeats sounds much like drumming. The drumming starts slowly and increases in speed, until the individual thudding beats merge into a fast, steady whir. Males also fight and display for females; displaying males fan their tails, puff out their ruffs, hiss and drag their wingtips along the ground.

A mated hen picks a secluded nesting site, usually at the base of a tree or under a bush, and lays 6 to 16 white or buff eggs in a leaf-lined depression in the ground. The hen may re-nest if nest destruction occurs. The incubation period is approximately 24 days, and the male does not help the female incubate eggs or brood young.

Baby grouse are precocial — they can leave the nest when dry. Chicks develop rapidly; at three weeks of age they can fly, and by autumn they look and act like adults. In early fall, birds of the year may exhibit a strange period of restlessness known as the “fall shuffle” or “crazy flight.” During this time, some young grouse take off in apparently undirected flight, and a few are killed when they crash into trees, fences, windows and the sides of buildings. The fall shuffle may serve to scatter broods and expand or disperse the population. Grouse rarely — if ever — die of old age in the wild. Juvenile mortality is great; most grouse die before they are a year old, and few live to be two years of age.

Population

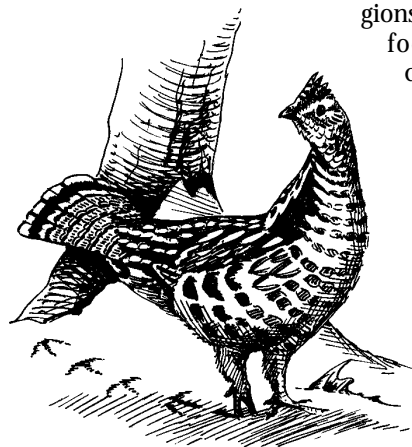
Many factors affect the size of the ruffed grouse population. A cold, wet spring following a harsh, long-lasting winter results in lower numbers of successful hatches. Many females succumb to bad weather conditions while trying to incubate eggs or brood young, and chicks find it especially hard to survive cold, drenching rains. Grouse can contract diseases which may kill or weaken them, making them more susceptible to predation; parasites affect grouse similarly.

Birds may die of a variety of physical accidents, including being hit by cars on back roads. Predation, severe weather and natural disasters like floods and forest fires also contribute to mortality. Hunters harvest only what biologists term “surplus” grouse, birds that would die of other causes before the next breeding season. Some wildlife biologists estimate that hunters can safely harvest two out of every five birds present at the beginning of hunting season without endangering the next year’s breeding stock. In years of good production, hunters usually take two or three juveniles for every older bird they harvest.

The grouse population seems cyclic, undergoing fluctuations — from low to high numbers of birds — that span periods of five to 10 years. Populations fluctuate differently in different regions, due to local cover,

food, and weather conditions. Grouse will not tolerate crowding; the minimum area needed to support a single brood is about nine acres.

Pennsylvania’s rapidly maturing forests and large deer herd have combined to re-



duce undergrowth and cover. Today, good grouse cover returns wherever forest tracts are cut or burnt off and then grow up in brush, duplicating favorable conditions that were present after the extensive logging of Pennsylvania’s forests around the turn of the 20th century.

Habitat

Cover is the most important factor affecting the size of our state’s grouse population. Cover is comprised of physical things that provide natural shelter and protection for wild creatures; grouse need cover for breeding, feeding, wintering and for raising young. Early in the 20th century, much of Pennsylvania provided excellent grouse habitat in brushy, logged-off forest areas. Today, these areas have grown up, or matured, and offer less suitable low cover.

Grouse are shy birds and their range has shrunk where cities and towns have expanded; they don’t readily adapt to civilization. Grouse can do well in areas without visible water sources, obtaining moisture from vegetation they eat. They seldom starve during the winter, as they are capable of “budding” (eating tree buds that are available regardless of snow depth).

The following plant species and situations contribute to good grouse habitat and should be encouraged: mountain laurel and greenbrier thickets, especially those including some hemlocks or white pines; prolific sprout growth in areas that have been burned or logged within the last 10 years and are growing up again; dense pine clusters in immature hardwood forests; stands of wild crab and hawthorn trees; edge provided by logging roads and trails through wooded areas; and abandoned apple orchards near thick cover. Taller trees can be felled to allow more sunlight to reach grapevines, greenbriers, small conifers, thornapple trees and the like.

Aspen stands can be managed to favor grouse. Aspen has about a 40-year life expectancy and produces a maximum amount of buds at this age. A percentage of mature trees can be cut every 10 years, producing four different growth stages in each stand; further segments of each 10-year stand can be cut every two years to give five ages within each stand. These practices result in a variety of age groups — from one to 40 years old.

Landowners interested in building a good grouse population should also try to increase the following on their property: junberries, grapes, greenbriers and witch hazel. At the same time, they should cull out towering, shade-producing trees which may kill the more favorable low fruiting vegetation.

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Wildlife Note — 31
LDR0103

Shrews

by Chuck Fergus

Although most people never see one, shrews are plentiful animals that play an important role in nature. Shrews belong to the order Insectivora, a diverse group considered the most primitive of the true placental mammals. As their name suggests, Insectivores feed mainly on insects. Shrews do most of their feeding above ground or in tunnels in the leaf mold and debris right at the ground's surface. They are related to moles, insect-eaters that live deeper in the soil.

Shrews range in size from the pygmy shrew (a little over three inches long, weighing 0.08 to 0.13 ounces) to the short-tailed shrew (4 to 5 inches long, 0.44 to 0.82 ounces). In each of the seven shrew species inhabiting Pennsylvania, the sexes are equal in size and weight.

Shrews have long, pointed noses, beady eyes and slender skulls. Their small ears are covered (or nearly so) by short, velvety fur. Here's how to tell one from a mouse: shrews have five toes on each foot (most mice have four toes on their front feet); shrews' teeth are sharp and pointed, and often stained dark (mice have chisel-like cutting incisors typical of rodents, without the dark staining); and shrews' eyes are beadier and their noses more pointed than those of mice. Most Pennsylvania shrews look fairly similar, and it often takes an expert to tell them apart.

Active year-round, shrews have terrific metabolic rates and must eat almost continuously. They are quick and aggressive and may attack animals larger than themselves. At least one species of shrew has poisonous saliva, a rare example of toxicity in mammals. Delivered with a bite, the toxin slows down or kills prey, and can cause soreness and swelling in humans.

Shrews are short-lived. They die from floods, starvation, rapid temperature changes, accidents, fights with other shrews and even from shock due to fright. Many predators catch and kill them, perhaps in mistake for mice, but because shrews secrete a repelling musky odor, predators often do not eat them.

Shrews raise several litters each year. Gestation is about three weeks. Newborn young are helpless and unfurred, but grow rapidly and reach adult size when 4 to 6 weeks old. For more specific life history information, see listings under each species.

Masked Shrew (*Sorex cinereus*) — The masked shrew is the most widely distributed shrew in North America, ranging over almost all of the continent's northern half. It occurs throughout Pennsylvania. Overall length, 3.3 to 4.3 inches; tail, 1.4 to 1.8 inches; weight, 0.12 to 0.2 ounces (less than a dime).

Masked shrews molt twice a year. In winter, they are dark brown to almost black on their upperparts, lighter brown or grayish on their underparts. Summer coloration is lighter and browner. *Sorex cinereus* closely resembles the slightly smaller pygmy shrew.

Masked shrews inhabit wooded areas, living under rocks logs and in the leaf litter, often in swamps or along stream banks or spring runs. Rarely found in dry fields, they occasionally inhabit hedgerows and stone walls in open country. Masked shrews spend most of their lives in underground runways they construct, or in the tunnels of mice or other small mammals.

Masked shrews sometimes climb into low bushes or fallen trees. They are good swimmers but rarely enter the water. Their ability to see and smell are poor, but their sense of touch is well-developed.

Masked shrews eat insects, worms, centipedes, slugs,

Short-tailed
Shrew



snails, mollusks and spiders, vegetable matter such as moss and seeds, and carrion. They probably do not store food. One observer reported that a captive ate over three times its body weight daily.

The species nests under logs, stumps or rocks, in fist-size nests of leaves, grass and fine rootlets. Breeding runs from March to September. After an 18-day gestation, 2 to 10 (usually about 7) young are born. They are blind and helpless but grow quickly and are on their own after about a month. They mature sexually at 20 to 26 weeks of age. An adult female may raise three litters; the male remains with the family during the early life of the young.

Masked shrews are active day and night, but especially at dusk. An individual's heart beats 1,200 times per minute, evidencing its rapid metabolism. Owls, hawks, herons, shrikes, weasels, foxes, cats and the larger shrews kill masked shrews, few of which reach their maximum lifespan of about 18 months.

Smoky Shrew (*Sorex fumeus*) — The smoky shrew occurs throughout the Northeast from Nova Scotia to North Carolina. It inhabits most of Pennsylvania but is scarce in southwestern and southeastern counties.

Coloration is a uniform dull brown, except for the bi-colored tail, brown above and yellowish below, and pale buffy feet. In summer, the fur is slightly darker and browner. The smoky shrew resembles the masked shrew but is larger, stouter and darker. Overall length, 3.7 to 5 inches; tail, 1.4 to 2 inches; weight, 0.21 to 0.35 ounces, about one-third the weight of a house mouse.

The smoky shrew prefers cool, damp woods with deep leaf litter. Prime habitats include deep, shaded hemlock ravines, northern hardwood forests, spruce and sphagnum bogs, and stream borders with moss-covered boulders and logs.

Smoky shrews may be active at all hours. They burrow through the leaf mold or travel in other animals' tunnels. They eat insects, salamanders, snails, worms, spiders and small birds either alive or as carrion.

These shrews build baseball-size nests of dry vegetation deep within rocky crevices or stone piles, or under rotting logs, stumps or boards. They breed from late March into August. Females bear up to three litters annually, of 2 to 8 (usually 5 or 6) young. Offspring are independent by one month of age.

Smoky shrews appear to be social animals, with populations fluctuating from year to year. They fall prey to short-tailed shrews, weasels, foxes, bobcats, hawks and owls. Maximum lifespan is about 17 months.

Long-tailed Shrew (*Sorex dispar*) — The long-tailed shrew inhabits the Appalachian Mountains from Maine to North Carolina. It occurs throughout Pennsylvania, except in the extreme southeast and west.

Sorex dispar likes cool, damp forests, deciduous or mixed. It is also called the rock shrew, since its preferred habitat is rock-slides, where it lives in natural tunnels among the jumbled boulders. In Pennsylvania, the species prefers mountain slopes.

Long-tailed shrews are dark gray with slightly paler underparts in sum-

mer, and an overall slate gray in winter. Total length, 3.9 to 5.3 inches; tail, 2 to 2.3 inches; weight, 0.14 to 0.21 ounces.

Foods include small invertebrates and plant materials. Little is known of the life history of this shy species, but it is probably similar to those of the masked shrew and smoky shrew, which often share the same habitat.

Pygmy Shrew (*Sorex hoyi*) — The pygmy shrew ranges across much of northern North America. It occurs in northern and western Pennsylvania, but records are sparse.

This is the smallest mammal in Pennsylvania and one of the smallest in the world. Overall length, 3.2 to 3.8 inches; tail, 1.1 to 1.3 inches; weight, 0.08 to 0.13 ounces — about half that of a large earthworm. In the field, the pygmy shrew is almost impossible to distinguish from a small masked shrew.

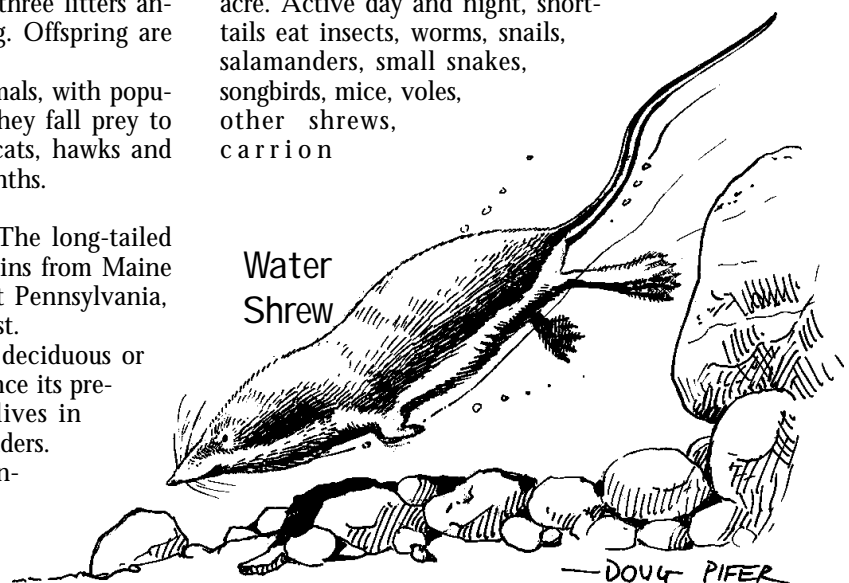
Pygmy shrews often live in wet or closely mingled wet and dry habitats. They live under old stumps and rotting logs, among the litter in sedges, ferns, aspen clumps, and hardwood forests, and in heavy conifer stands bordering water.

We know almost nothing about the species' life history, but it is probably similar to those of other long-tailed shrews (long-tailed, smoky and masked shrews).

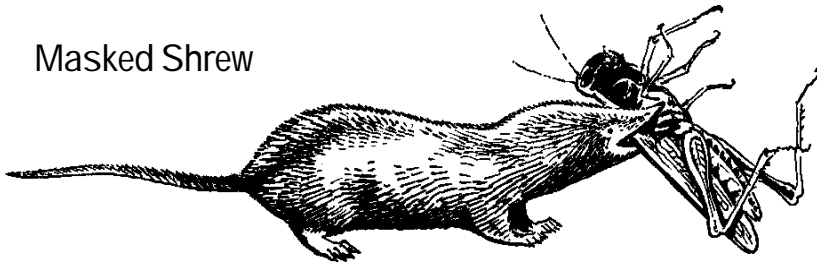
Short-tailed Shrew (*Blarina brevicauda*) — The short-tail is one of the commonest shrews and most abundant small mammals in its range. It inhabits the eastern United States from southern Canada to Florida, and occurs statewide in Pennsylvania.

This shrew is dark slate above and paler below, slightly lighter in summer than in winter. It is the largest and most robust of Pennsylvania shrews. Overall length, 4.1 to 5.2 inches; tail 0.7 to 1.2 inches; weight 0.44 to 0.82 ounces.

Short-tailed shrews live in almost all habitats: woods, banks of small streams, tall grass and brush. They frequent the top few inches of soil and leaf litter, digging their own tunnels or using those of mice, voles and other small mammals. They burrow through the snow in winter. Home range is a half-acre to an acre. Active day and night, short-tails eat insects, worms, snails, salamanders, small snakes, songbirds, mice, voles, other shrews, carrion



Masked Shrew



and vegetable matter. Individuals cache food in small chambers in their burrows.

The short-tailed shrew has poor eyesight, a fair sense of smell and keen hearing and touch. It possesses poisonous saliva but lacks an efficient injection system, so the toxin must get into a prey animal through cuts caused by the shrew's sharp teeth. The toxin slows down or kills warm-blooded prey.

Blarina brevicauda weaves dry plant materials and hairs into two types of nests, a resting nest and a larger mating structure, beneath logs, stumps, rocks and debris. Breeding may begin as early as January; 3 to 10 young (usually 5 to 7) are born 21 days later and are on their own at 25 days of age. Two or three litters may be raised per year.

Foxes, dogs, bobcats, cats, skunks, weasels, hawks, owls, shrikes and snakes kill short-tailed shrews. The average lifespan is 18 to 20 months.

Least Shrew (*Cryptotis parva*) — The least shrew lives in the southeastern and central United States, north and east into New York. It's found statewide in Pennsylvania. Coloration is cinnamon to brown above, ashy gray below, darker in winter than in summer. Overall length, 2.7 to 3.5 inches; tail, 0.47 to 0.78 inches; weight, 0.14 to 0.2 ounces.

Favored habitats are open, dry situations, such as old pastures or meadows, or along woodland edges. Least shrews are scattered in local colonies throughout suitable habitat. More convivial than most other shrews, which tend to be belligerent toward others of their own species, least shrews may nest in groups of a dozen or more, especially in winter.

Least shrews are active at all hours, but mainly at night. They travel their own or other small mammals' runways and burrows. They eat insects, earthworms, centipedes, millipedes, snails, mollusks, frogs and carrion, and they drink water freely.

Least shrews build nests of dried grass or leaves, either

underground or beneath logs, stumps or debris. They breed from March through November. Three to six blind, hairless young are born following a gestation period variously reported as 15 to 23 days. Several litters may be raised each year. Both parents care for the young, which are weaned at 21 days. Longevity is less than two years.

Water Shrew (*Sorex palustris*) — The water shrew inhabits much of northern North America. In the East, it ranges from New England to North Carolina. It is found across Pennsylvania's northern half, and south through the Appalachians.

Sorex palustris is the second largest Pennsylvania shrew (the short-tailed shrew is more robust). Overall length, 5.3 to 6.1 inches; tail, 2.4 to 3.5 inches; weight, 0.35 to 0.6 ounces. In winter, the pelt is brownish-black above (sometimes faintly grizzled with silver) and light gray below. In summer, the upperparts are browner and the underparts paler. The long tail is brownish-black above, paler below.

The water shrew inhabits heavily wooded areas and is adapted to a semi-aquatic life. The banks of cold, clear streams provide optimum habitat. Water shrews occupy small surface runways under bank overhangs, fallen logs and brushpiles. They also live in bogs and springs, and may shelter in a beaver lodge or muskrat house in winter. Nests are usually made of dry moss.

This shrew uses its big hind feet, fringed with short, stiff hairs, to paddle about under water. It can stay submerged about 15 seconds. Water cannot penetrate the shrew's dense pelage, so the animal itself never gets wet. A water shrew can run short distances across the water's surface, buoyed up by globules of air like a water bug.

Water shrews locate aquatic prey by touch. They eat insects and other small invertebrates (both aquatic and terrestrial), small fish and fish eggs.

Little is known about the breeding habits of this secretive species. The gestation period is about three weeks, with 4 to 8 young born from late February to June. Females probably bear more than one litter each year.

Water shrews tend to be nocturnal but are also active at dusk, on cloudy days, and in the shade on sunny days. Predators include weasels, mink, otters, hawks, owls, snakes and fish (smallmouth bass, trout and pickerel). Longevity is about 18 months.

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Wildlife Notes

Allegheny Woodrat	Northern Cardinal, Grosbeaks, Indigo Bunting
Bats	and Dickcissel
Beaver	Opossum
Black Bear	Otter
Blackbirds, Orioles, Cowbird and Starling	Owls
Blue Jay	Porcupine
Bobcat	Puddle Ducks
Bobwhite Quail	Raccoon
Canada Goose	Rails, Moorhen and Coot
Chickadees, Nuthatches, Titmouse and Brown	Raptors
Creeper	Ring-necked Pheasant
Chimney Swift, Purple Martin and Swallows	Ruby-throated Hummingbird
Chipmunk	Ruffed Grouse
Common Nighthawk and Whip-Poor-Will	Shrews
Cottontail Rabbit	Snowshoe Hare
Coyote	Sparrows and Towhee
Crows and Ravens	Squirrels
Diving Ducks	Striped Skunk
Doves	Tanagers
Eagles and Ospreys	Thrushes
Elk	Vireos
Finches and House Sparrow	Vultures
Fisher	Weasels
Flycatchers	White-tailed Deer
Foxes (Red & Gray)	Wild Turkey
Gray Catbird, Northern Mockingbird and	Woodchuck
Brown Thrasher	Woodcock
Hérons	Wood Duck
Kingfisher	Woodpecker
Mallard	Wood Warblers
Mice and Voles	Wrens
Minks & Muskrats	



Wildlife Note — 62
Ldr1204

Snow Goose

By Chuck Fergus

The snow goose, *Chen caerulescens*, is one of the world's most abundant waterfowl species. Snow geese breed in the arctic and subarctic regions of North America during spring and summer, then migrate south to spend the winter in inland and coastal areas, including Pennsylvania. They feed voraciously on vegetation, and recent population increases have led to serious damage of the species' habitat, mainly on its breeding range, but also in some wintering areas.

Biology

A medium-size goose, the snow goose is 27 to 33 inches long, with a wingspread of about 54 inches. It has a chunky body and weighs from 3.5 to 7 pounds, with males slightly heavier than females.

Chen caerulescens has two distinct subspecies, the greater snow goose and the lesser snow goose. The lesser snow goose is dimorphic, meaning it comes in two color phases, white and blue. The white phase is all white with the exception of black primary wing feathers. On the blue phase, the head and front of the neck are white, and the body is gray-brown, with white or gray underparts. Intermediate color forms also occur. All snow geese have, in addition to black primaries, a black patch on the edge of the bill, suggesting a grin when viewed from the side. The eyes are dark, the bill is pink, and the legs are dark pink. White individuals sometimes show rust-colored stains on the head and neck, caused by the birds' grubbing for food in muddy ground.

It is primarily the greater snow goose that winters in Pennsylvania. The lesser snow goose's U.S. wintering range has traditionally been a column sweeping from north to south through the Midwest part of the country, not reaching as far east as Pennsylvania. As the range of the lesser snow goose expands, however, blue phase geese are being seen infrequently on Pennsylvania wintering grounds.

Snow geese are good swimmers. They do not normally dive to find food, but can submerge to evade predators. They walk readily on land, and run swiftly. They sleep floating on the water, or on land, sitting down or standing on one leg; the head is held low or tucked partway beneath one wing. Strong fliers, snow geese can reach speeds of 50 miles per hour. *Chen caerulescens* is extremely vocal. Individuals sound a *whouk* or *kowk*, given repeatedly in flight and on the ground and resembling the shrill barking of a dog. When feeding, snow geese make quieter *gah* notes. Parent birds utter *uh-uh-uh* vocalizations to their goslings.

Snow geese feed in shallow water and on the ground, typically in saturated soil. On their breeding grounds they



eat leafy parts of grasses, sedges, rushes and other aquatic plants, and grub out the roots and tubers of a variety of land plants and shrubs. En route to and on the southern wintering grounds, they dine on aquatic grasses, sedges and rushes; berries; corn, wheat, barley and other grains gleaned from harvested fields; and pasture grasses and leafy stems of crops such as winter wheat and rice. In winter, snow geese feed from two to more than seven hours per day. In spring, when building up fat reserves for migration, they may feed more than 12 hours daily.

Males and females establish lifelong pair bonds. Most snow geese choose mates having the same color as the family in which they themselves were reared. Individuals pair up during their second winter or on their second northward migration, when they are almost two years old; generally they first breed successfully at age three. During courtship, the male puffs up his body and stands in an exaggeratedly straight and tall posture. Males and females display to each other by raising the head and neck, calling vociferously and flapping their wings. Mating takes place in shallow water and on land.

Snow geese nest on arctic tundra, near river mouths and on islands, usually within five miles of the coast. They gather in colonies varying greatly in number and density of pairs. A pair defends an area around its nest, where both partners feed heavily. The female builds a shallow nest out of plant material and down plucked from her body; she may reuse her previous year's nest. Nests are often sited on low ridges or hummocks offering good visibility over the surrounding terrain. A female typically lays three to five creamy white eggs, sometimes as many as seven. Incubation is by the female alone, with the male remaining close to the nest. Sometimes one pair may trespass in another pair's territory; while the resident male is occupied in driving off the intruding male, the intruding female tries to lay an egg in or near the resident female's nest. Because unattended eggs attract predators, a female will usually roll a deserted egg into her own nest, which can lead to her rearing another female's young. Biologists describe this phenomenon as "nest parasitism."

Main nest predators are foxes, gulls and parasitic jaegers. Bears, wolves and ravens also take some eggs. Eggs hatch after 22 to 23 days of incubation. The goslings emerge wet, but dry within four hours beneath the brooding female. Goslings are able to walk, swim, dive and feed soon after they leave the nest, usually within hours of hatching.

Both parents help raise the young. A family may walk

more than two miles per day between food sources and up to 45 miles during the brood-rearing season. Goslings graze on vegetation, and also eat some insects. They grow rapidly, gaining around 5.5 ounces per day. Goslings are taken by gulls, foxes and snowy owls; adults are occasionally preyed on by foxes, wolves, bears and eagles.

The young begin to fly 42 to 50 days after hatching. They stay with their parents while migrating south for their first winter. The family remains intact through the winter and during the migratory journey north again in spring. After arriving on the breeding grounds, the family breaks up and the adults begin rearing another brood.

During migration, snow geese fly both by day and night. In fall, they often travel in large flocks with more than 1,000 members; spring flocks vary in size from a few dozen to a few hundred individuals. Usually they migrate along fairly narrow corridors, with traditional stopping points along the way. Migrating snow geese take advantage of following winds, good visibility and periods of no precipitation. They fly in long, diagonal lines and in V-formations, at altitudes of up to 7,500 feet. When preparing to land, they may tumble to lose height in what has been described as a "falling-leaf" maneuver.

The species' breeding range extends from Alaska east to western Greenland. Biologists recognize three separate populations. The western population breeds in Alaska and Canada's Yukon, Northwest and Nunavut territories and winters from Oregon south to Mexico, with concentrations in the central valleys of California. The midcontinent population breeds from Nunavut Territory east to Hudson Bay and winters in the U.S. Midwest south to Louisiana and Texas. The eastern population breeds on islands in the High Arctic, including Ellesmere and Baffin then winters along the Atlantic Coast from Massachusetts to South Carolina, with concentrations in southeastern Pennsylvania, New Jersey, Delaware, Maryland, Virginia and North Carolina. In winter, snow geese are highly gregarious and often feed in flocks numbering thousands of individuals.

Migrants follow all four major North American flyways.

Migration north from wintering areas takes place from February to May. In autumn,

snow geese depart from the northern breeding areas in

September and arrive in wintering habitats in November and December.

In Pennsylvania, snow geese are seen more frequently in spring than in fall.

They pass through the state from about the third week of February to the first week of April, with a peak in early to mid-March; an excellent place to view migrating snow



geese is the Game Commission's Middle Creek Wildlife Management Area in Lancaster County, where up to 150,000 birds have been seen. In autumn, the greatest numbers of snow geese pass through Pennsylvania in November. Each year, weather conditions and food availability influence migration dates.

Snow geese can live beyond 26 years. Individuals perish from avian cholera, hitting power lines in flight, hunting and predators. Predators on the wintering range include coyotes, foxes and eagles.

Habitat

In summer, snow geese nest along braided river mouths, on islands and in sections of arctic tundra studded with ponds. Many of the greater snow geese that winter in Pennsylvania nest in the eastern high arctic, with Baffin and Bylot islands containing the largest colonies. They favor areas that become clear of snow early in the year and do not flood during the spring thaw. Parents lead their goslings to food-rich areas — damp meadows, edges of freshwater lakes and ponds and tidal marshes. During migrations, snow geese frequent freshwater and brackish marshes, slow-moving rivers, lakes, ponds and farm fields. Winter habitats include coastal marshes, wet grasslands and agricultural fields. Pennsylvania is attractive to snow geese because of the large number of agricultural fields. Waste grain left after harvesting allows birds to recharge fat reserves needed for spring migration and nesting and, thus, has been implicated in increasing survival rates. At times, snow geese can be destructive feeders, pulling stems and roots of plants out of the ground. This grubbing behavior is largely responsible for extensive habitat damage of marsh habitats on both breeding and wintering areas.

Population

Around 1900, the population of *Chen caerulescens* had ebbed to only 2,000 to 3,000 birds. During the 20th century and into the 21st century, the population has burgeoned as snow geese have begun taking advantage of farm crops, including waste grain, along migration routes and in wintering areas. In some areas, populations have increased as much as 9 percent per year. Biologists estimate that there are now 5 to 6 million snow geese in North America, a population that may be too large to be environmentally sustainable.

Each year, wintering populations vary in abundance, depending on nesting conditions in the arctic (cold, wet weather may drastically lower breeding success); the availability of food on breeding grounds, staging areas and stop-over points along migration corridors; and hunting pressure. Harvest estimates since 1998 indicate that from 1 to 1.5 million birds are harvested annually. Recent conservation hunts implemented in Canada and the U.S. have been successful in doubling the harvest rates of snow geese and bringing down the populations of both lesser and greater snow geese. When snow geese populations are too large, the birds' feeding can destroy their own habitat, which is also used by other species.

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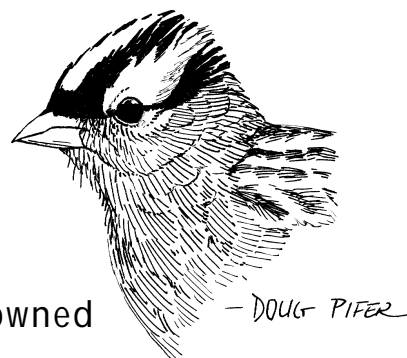


Wildlife Note — 45
LDR0103

Sparrows and Towhee

by Chuck Fergus

White-Crowned
Sparrow



At first glance, sparrows (Family Emberizidae) may seem to be drab, ordinary birds. Because of their apparent sameness — as well as the dense or grassy cover in which most are found — beginning and casual birdwatchers may find it tough to identify the different species. In fact, the plumage of each is a distinctive, complex blending of shades and streakings of brown, and the birds' habits and adaptations work in fascinating ways to let them take advantage of many habitats. "Sparrow" comes from *spearwa*, an Anglo-Saxon word meaning "flutterer"; English settlers applied the name to New World sparrows. (In England today, birds we would call sparrows are referred to as buntings.) More than 30 species are native to North America. Eleven breed in Pennsylvania, and five more cross the state when migrating.

Sparrows have short thick bills for cracking the hard seeds of grasses, weeds and trees. Most forage on the ground, scratching with their feet to expose food in dense grass and weeds and in low shrubs. They keep in contact with mates or flock members by using short calls, often *chip* or *seep* sounds, which vary between species. Sometimes sparrows make short flights to catch flying insects that they've flushed from the ground. Adults eat insects in summer and nourish their young with this high-protein fare. In late summer and fall, sparrows eat berries and fruits. And they eat many seeds, especially those of grasses and weeds.

Males defend territories mainly by singing from exposed perches, and their songs are often complicated and mellifluous. The males of some grassland sparrows perform flight-and-song displays. Males also chase away rivals. In most species, pairs nest in isolation or in loose colonies brought together less by social tendencies than by attraction to a special habitat. Sparrows usually nest in low bushes or on the ground. The typical nest is an open cup woven out of grass, weeds and twigs, built mostly or entirely by the female. The eggs of the various Northeastern sparrows are spotted or blotched with brown. In most species, the female incubates the eggs; the male may bring food to her. Both parents share in feeding the young. Should a female begin a second brood, her mate may assume the care of first-brood young that have fledged from the nest.

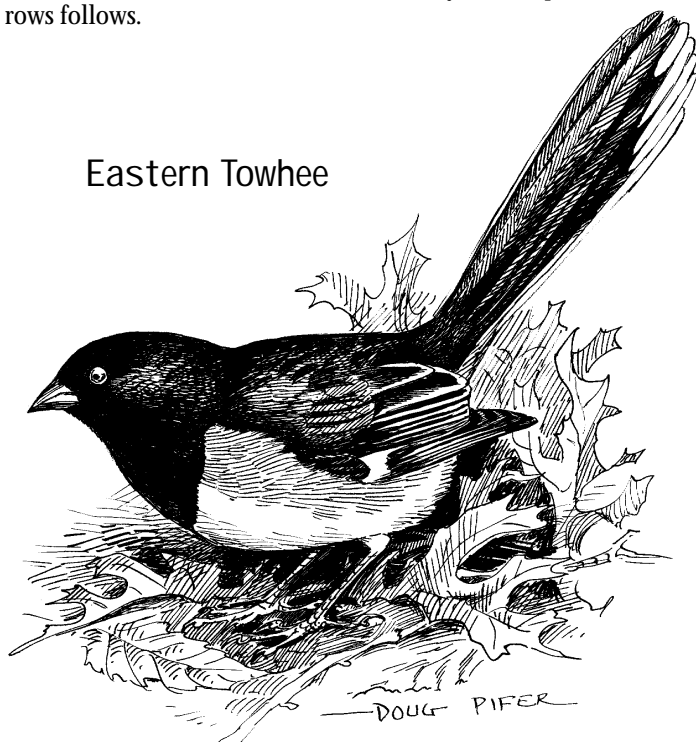
Ornithologists believe that most sparrow pairs are mo-

nogamous, but the breeding biology of many species hasn't been studied carefully enough to allow definite conclusions. In the savannah sparrow, males may have two mates whose broods are staggered, so that the male can help first with one brood and then with the second. Some male swamp sparrows also have two mates.

Sparrows do not make long migrations. Most species winter in the southern United States and northern Mexico, and none go as far as the tropics. In winter, sparrows are often gregarious and travel in flocks when searching for food. In open country, flocks often contain individuals of only one species, but in brushy areas or along woods edges, which offer a more diverse suite of foods, mixed-species flocks are the rule. By far the greatest threat to sparrows is the destruction of their habitat. Draining swamps and converting fields to housing developments relentlessly cuts into the size and diversity of sparrow populations — as well as harming many other kinds of wildlife.

A closer look at five common Pennsylvania sparrows follows.

Eastern Towhee



Chipping Sparrow



Eastern Towhee (*Pipilo erythrophthalmus*) — Formerly called the rufous-sided towhee, this large (seven to eight inches), long-tailed sparrow breeds statewide in Pennsylvania. Adults have rusty sides, white bellies, and solid-colored backs and heads that are black in the male and brown in the female. The eyes are red. Males sing a distinctive *drink your tea*, with the middle syllable low and the last syllable drawn out and quavering. Both sexes frequently give an emphatic *chewink* or *tow-hee* call. A way to locate the birds is to listen for the rustling they make while scratching for food in the leaf litter. The eastern towhee is sometimes called the “chewink,” for its call, and “ground robin” for its foraging habits.

Eastern towhees are found mainly in second-growth forests, overgrown fields, woods edges, clearcuts, hedgerows, thickets, dense brush, and the understory of open deciduous woods. Rarely do they live in suburban yards, cities or intensively farmed areas. When seeking food, towhees energetically turn up leaves by hopping backwards, scratching with both feet. They pick up beetles, ants, bugs, spiders, millipedes and snails; they eat caterpillars (including late-stage gypsy moth larvae) and moths (adult gypsy moths and others); and they dine on seeds, small fruits, berries and acorns.

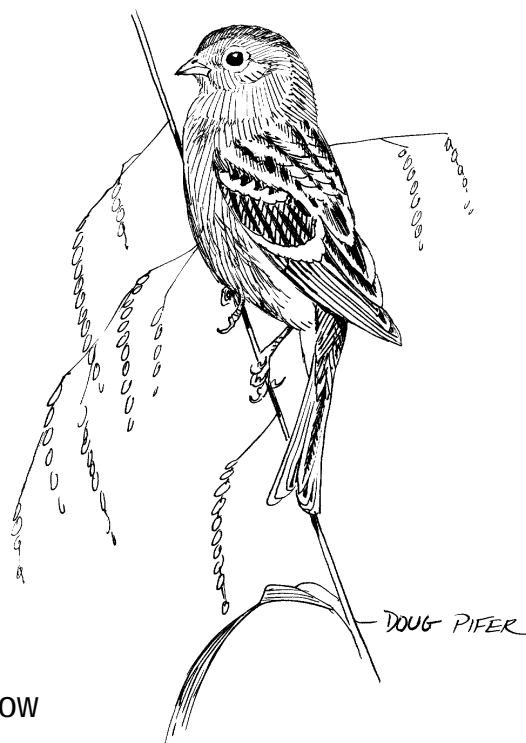
In April, males arrive in the north in small bands; they disperse and, singing from high perches, proclaim individual territories of one-half to two acres. Females show up about a week later. Males and females spread their wings and tails to each other, exhibiting their white patches. The female gathers materials for the nest, while the male sings nearby. She scuffs out a shallow depression in the ground and builds a bulky but well-camouflaged nest of leaves, bark strips and other plant matter, lined with fine grasses and pine needles. Occasionally the nest is built in a bush, as high as five feet above the ground.

The female lays three or four eggs, creamy white with

brown spotting. She incubates them for 12 to 13 days; during the day, she sneaks off to feed about once every half hour. After the eggs hatch, the male brings food for the brooding female and the young. In about a week the female begins leaving the nest to help the male forage and feed the brood. Young leave the nest after 10 to 12 days, and their parents feed them for another month. Most females build a second nest, and most pairs produce two broods. In Pennsylvania, towhees nest from late April into August. After fledging, young birds flock together; adults do not defend their territories against juveniles, even if not their own.

In winter towhees shift southward into the southern states, where they forage in loose flocks averaging 15 to 25 members. Females go farther south than males. The estimated life span is four to six years. The clearing of the Eastern deciduous forests around the turn of the century helped towhee populations to expand. More recently, as old fields have matured into woods, the population of this species has declined noticeably.

Chipping Sparrow (*Spizella passerina*) — This small, slim sparrow is about five inches long and marked with a rusty-colored cap and a line of white above each eye. The Pennsylvania breeding bird atlas survey found the chipping sparrow to be the fourth most widespread bird in the state; only the song sparrow, crow and robin were observed more frequently. Chipping sparrows feed and breed in suburbia, urban parks, gardens, clearings around rural homes, pastures, orchards, shrubby fields, open woodland and woods edges, in openings and roadsides within the deep woods. On a continental scale, they breed from Alaska to Nova Scotia



Field Sparrow

Song Sparrow

and south to Nicaragua. They are not very shy of humans. The song is a rattling or buzzing trill: a series of chips in one pitch. Chipping sparrows forage in trees and on the ground. Their diet in early summer may be 90 percent insects, including grasshoppers, caterpillars, beetles and moths. They eat many seeds, especially in fall and winter, of chickweed, pigweed, ragweed, foxtail and other grasses. Males arrive on the breeding range in April, ahead of females, and claim territories of one half to one and a half acres. In early May the females build nests, often in conifers (including suburban plantings) 3 to 10 or more feet above the ground. A female usually lines her nest with fine grasses or animal fur, including horse hair. The three or four eggs are a pale bluish green, marked with brown spots. The female incubates the eggs for 11 to 14 days; young fledge from the nest eight to 12 days after hatching. Chipping sparrows are believed to be monogamous breeders. Most pairs raise two broods per summer.

In August and September, family flocks desert their home territories and wander while searching for food. In late September and October, most chipping sparrows leave the Northeast for wintering grounds in the Gulf States. In the 1800s the chipping sparrow was the common sparrow of American towns and cities, but the introduced house sparrow largely took over that role. Chipping sparrows are preyed upon by blue jays, snakes, domestic cats, and the smaller hawks and owls; brown-headed cowbirds often parasitize first broods, but chipping sparrows raise their second broods after the cowbirds' annual breeding period has ended.

Field Sparrow (*Spizella pusilla*) — Like the closely related chipping sparrow, the field sparrow has a chestnut-colored cap; however, it lacks a white facial stripe and has a noticeably pink or rusty colored bill. The song is a series of sweet



notes speeding up into a trill swee-swee-swee-swee-wee-wee-wee-wee. Field sparrows live in old fields with scattered brush and bramble and sumac clumps, in thickets, fencerows, and Christmas tree plantations; they avoid open meadows, cropland, urban areas and deep woods. The species breeds in every Pennsylvania county but is absent from heavily developed areas around Lancaster, Philadelphia and Pittsburgh. It ranges across the East and winters from southern Pennsylvania southward.

Field sparrows arrive in their breeding habitat in mid-April. Males' territories average two to three acres.

Females build their nests on or near the ground for the season's first brood, then often select a thick shrub, such as a hawthorn, for a second-brood nest. The three to four eggs hatch after about 11 days of incubation. Unlike chipping sparrows, field sparrows rarely nest near human dwellings; like chipping sparrows, field sparrows permit people to come quite close. Field sparrows migrate south in September and October. *Spizella pusilla* was first described and named by ornithologist Alexander Wilson on the basis of specimens collected around Philadelphia.

Song Sparrow (*Geothlypis trichas*) — An accomplished songster, this shy sparrow has a heavily streaked breast with a dark central spot. When in the species' habitat of overgrown weedy areas, thickets or abandoned pasture land, listen for the melodious song: three or four repeated notes, sweet sweet sweet sweet, followed by a number of shorter variable notes and a trilled ending. Song sparrows breed across North America and winter in the lower 48 states. They breed statewide and abundantly in Pennsylvania; more song sparrows winter in the southern half of the state than in the northern half. Corn stubble and brushy thickets are prime wintering areas.

Song sparrows nest mainly on the ground in grasses, sedges



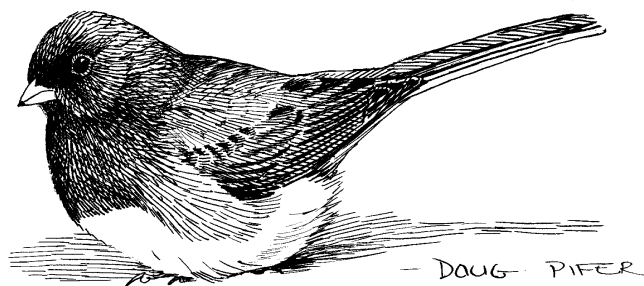
Tree Sparrow

and cattails, with later nests often located in trees or bushes up to 12 feet high; on rare occasions, song sparrows nest in tree cavities. Prolific breeders, they may raise two, three or even four broods per season, sometimes all in the same nest. The normal clutch is four eggs. The eggs of brown-headed cowbirds look very much like song sparrows' eggs (greenish white, heavily dotted and blotched with reddish brown) and, except for the yellow warbler, the song sparrow is the most frequently reported host for the parasitic cowbird. The song sparrow population in Pennsylvania seems to be stable or rising slightly.

Dark-Eyed Junco (*Junco hyemalis*) — Juncos are familiar winter visitors; many people are surprised to learn that juncos breed in Pennsylvania, too. These birds have slate-gray backs and heads, white bellies, pink bills, and white outer tail feathers. The springtime song is a slow musical trill similar to that of the chipping sparrow; what's usual in winter is a string of twittering notes. Ground-loving birds, juncos scratch in the leaf duff, soil and snow to expose their food. In summer, insects make up about half of the diet. Seeds of ragweed, foxtail, crabgrass, smartweed, pigweed, and other grasses and weeds predominate in fall and winter. Juncos also eat springtails, the tiny "snow fleas" that pepper the snow on warm winter days.

Juncos breed across northern North America and south in the Appalachians to Georgia. In Pennsylvania they nest on wooded ridgetops and in hemlock ravines across the forested northern third of the state. In spring, males stake out breeding territories of two to three acres, singing from tall trees — about the only time these birds ascend very far from the ground. Breeding runs from April into August. Females build nests on the ground: on vegetated cutbanks of logging roads, stream banks, and hillsides, or tucked beneath exposed tree roots overhung by dirt or plants. The three to six eggs are pale blue profusely dotted with brown. Some pairs raise two broods. Juvenile birds are streaked with brown.

Juncos move south in flocks, mainly in October. The individuals we see wintering in Pennsylvania probably bred or were hatched farther to the north. Winter flocks tend to have same-age, same-sex members; each flock numbers around 15 to 30 birds who forage together on an area of 10 to 12 acres. In winter, juncos favor hedgerows, brush piles, thickets, weedy fields and shrubbery around houses. At night, flock members roost together in a habitual site, usually in the dense boughs of a conifer.



Dark-Eyed Junco

Six other sparrows breed in Pennsylvania. The vesper sparrow (*Poocetes gramineus*) is a grassland species that breeds in scattered locales across the state; its numbers have declined in the last 30 years. The shy, inconspicuous savannah sparrow (*Passerculus sandwichensis*) nests on the ground in open grassy areas such as meadows, hayfields and reclaimed surface mines. Another species inhabiting grasslands and meadows is the grasshopper sparrow (*Ammodramus savannarus*). Henslow's sparrow (*Ammodramus henslowii*) breeds mainly in western Pennsylvania, in abandoned weedy fields, damp meadows and reclaimed strip mines. The swamp sparrow (*Melospiza georgiana*) is found in Delaware River tidal marshes, in freshwater marshes in the state's northeastern and northwestern quadrants, and elsewhere in bogs, swamps, and rank growth adjoining ponds and sluggish streams. The white-throated sparrow (*Zonotrichia albicollis*) breeds mainly in the north, often in or near forested wetlands, and its range extends south into Pennsylvania's northern tier; this chunky, colorful sparrow is also frequently seen during migration.

As well as the above-mentioned species, other sparrows move through Pennsylvania in spring and fall. The American tree sparrow (*Spizella arborea*) is a common migrant and a winter resident. The red fox sparrow (*Passerella iliaca*) and white-crowned sparrow (*Zonotrichia leucophrys*) also may winter in Pennsylvania. The saltmarsh sharp-tailed sparrow (*Ammodramus caudacutus*) and Lincoln's sparrow (*Melospiza lincolni*) migrate through our state.

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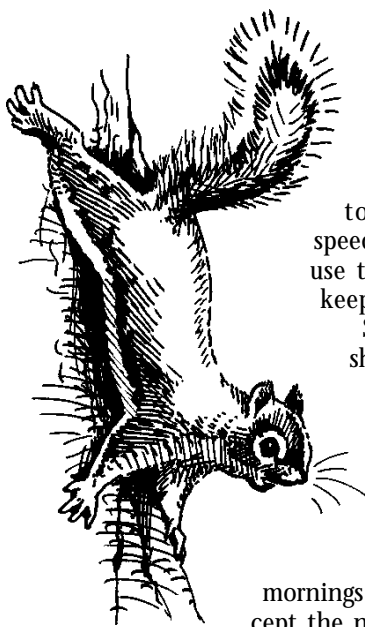


Wildlife Note — 1
LDR0603

Squirrels

by Chuck Fergus

Most Pennsylvanians are familiar with the gray squirrel, which lives both in towns and rural areas. The gray is our state's most common squirrel; the fox, red and flying squirrels are three other species native to our state.



Squirrels are fast and agile, scaling trees and jumping from treetop to treetop with great speed. When jumping, they use their large tails to help keep balanced.

Squirrels see only in shades of black and white, but their eyes are sharp and detect movement well. They have keen senses of hearing and smell. They are most active in early

mornings and late afternoons, except the nocturnal flying squirrel.

Squirrels are rodents, and the four species do not interbreed. Born blind and hairless, young are dependent upon their mother for up to two months.

Biology

Gray squirrel (*Sciurus carolinensis*) — Adult gray squirrels weigh 1 to 1½ pounds and are 18 to 20 inches in length; about half this length is a broad, bushy tail. Most grays are colored silvery-gray above and off-white below, often with rusty or brownish markings on the sides or tail. Albinism is rare, but melanism (black coloration) is fairly common. Once, black-phase gray squirrels were found throughout Pennsylvania; today they occur most often in the northcentral counties. "Black squirrels" may be any shade from dark gray to nearly jet black, often with a brownish tinge.

Gray squirrels eat mast — acorns, hickory nuts, walnuts and beechnuts. Other foods include berries, mushrooms, pine seeds and corn (only the germ at the base of the kernel is eaten), and dogwood, wild cherry and black gum fruits.

In early spring, squirrels eat buds, a high-energy food. They eat the buds and flowers of red and sugar maples in April, and later may feed on the winged fruits of red maple. These foods have a high moisture content that supplies squirrels' water needs, although grays will drink from available ground water sources. Grays smell out nuts they have previously buried for winter food. Unrecovered nuts may sprout and grow into trees. In this way, squirrels help ensure continual forest growth.

Grays are probably the wariest of Pennsylvania's squirrels. They're quicker than fox squirrels and less vocal than reds, although they sound warning barks and assorted "chucks." Hawks, owls, foxes and tree-climbing snakes occasionally kill young squirrels, but adults are not easily taken. Predators do not appreciably affect squirrel populations on good ranges — availability of food is the key to population size.

A maximum life span for a wild gray squirrel could be 10 years or even longer, but few live more than two or three years. Grays live in nests and dens. They build leaf nests in trees near good food supplies in both summer and fall. The leaf nests are cooler than tree dens, they're about 12 by 16 inches and are built of twigs, leaves, grass, bark and other plant materials. Tree dens are often in cavities where limbs have broken off or in deserted woodpecker holes, usually 40 to 60 feet off the ground. Resident squirrels gnaw back the outer tree bark that, in time, would otherwise seal off den holes.

Gray squirrels breed in late winter or early spring. Following a 44-day gestation period, females bear litters of 4 to 5 young in late February, March or early April. The young are usually raised in tree dens and nursed by their mother for 5 to 7 weeks. Gray squirrels often bear a second litter in July or August, and small grays seen in autumn are from summer litters. Grays are gregarious and do not seem to demonstrate territoriality. Three or four individuals may feed side by side where food is plentiful.

Fox squirrel (*Sciurus niger*) — Fox squirrels are found mainly in the western and southern counties. Unlike grays, fox squirrels prefer open, park-like woods with sparse ground cover, usually avoiding mountains and extensive forests. Their nesting, denning and feeding habits are much like those of gray squirrels.

Fox squirrels have gray to reddish-gray upper parts and buff to pale orange-brown undersides. Larger than grays, weighing nearly two pounds, they are slower, more sluggish and less vocal. They are about 21 inches in length, including a 10-inch tail.

Like the other Pennsylvania tree squirrels, fox squirrels never actually hibernate in winter but will hole up and sleep soundly through several days of snowstorms or extreme cold.

Mating season is in January, and young are born in late February or early March. Average litter size is 2 to 4 young; only one litter is raised per year.

Fleas, chiggers and mosquitoes may bother squirrels, and tapeworms have been found in some specimens. Fox and gray squirrels seem to get along together wherever their ranges overlap.

Red Squirrel (*Tamiasciurus hudsonicus*) — The red squirrel is alert, raucous and energetic. About half the size of the gray, the red measures about a foot from nose to tail-tip and weighs about 5½ ounces. In summer its fur is a rich, rusty brown, turning grayer in winter, when this squirrel also develops prominent ear tufts. The undersides are off-white.

The red squirrel is sometimes called a chickaree or a pine squirrel, reflecting its preference for nesting in conifers. Behavior, feeding habits and denning practices are generally similar to those of gray and fox squirrels, although reds sometimes nest in holes at the base of trees. They enjoy eating the immature, green cones of white pine. Unlike fox and gray squirrels, reds do not bury nuts singly, preferring a large cache — often in a hollow log — for storing food.

The breeding season for red squirrels begins in late winter, with 3 to 6 young born in April, May or June after a 40-day gestation period. Reds have strong territorial instincts, often defending food sources and den trees against intrusion, and will even aggressively drive off trespassing grays.

Southern Flying Squirrel (*Glaucomys volans*) — The southern flying squirrel is found throughout Pennsylvania; it occurs from southern Maine to Florida and from Minnesota to Texas, with isolated populations in Mexico and Central America. The southern flying squirrel is slightly smaller than the closely related northern flying squirrel, and much more common in Pennsylvania.

Adults are 8 to 10 inches long, including a 3- to 5-inch tail. Weights range from 1.5 to 3 ounces. The soft, velvety fur is grayish brown on the back and pearly white on the belly. The large, dark brown eyes are adapted for night vision. The so-called flying membrane is a loose flap of skin between the fore and hind legs on either side of the body; when a flying squirrel extends its legs, they stretch the membrane taut, making an airfoil on which the animal can glide from one tree to another or from a tree to the ground. A flying squirrel can sail up to 40 yards in a downward direction. It uses its broad, flat tail as a rudder.

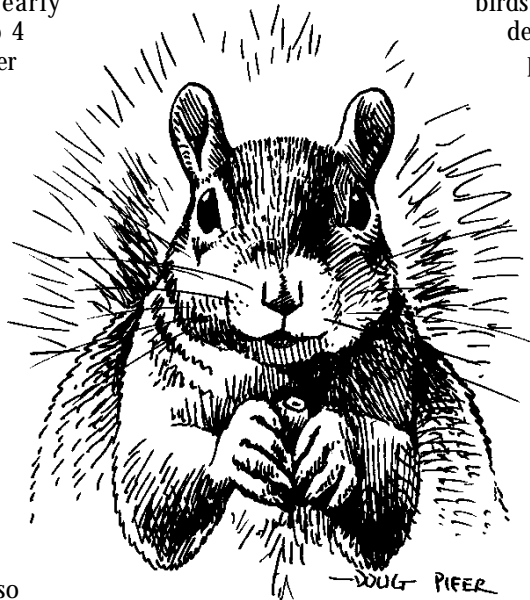
Flying squirrels are mainly arboreal, although they also forage on the ground. They are rarely seen, since they are nocturnal. They nest in hollow tree limbs and woodpecker cavities and sometimes in large birds' nests, which they cap with shredded bark and leaves. After a gestation period of about 40 days, 2 to 7 young (on average, 3 or 4) are born in April, May or June. The young are weaned after about two months. Adult males do not help the females rear the young. The southern flying squirrel may produce two litters per year, with the second litter arriving in September.

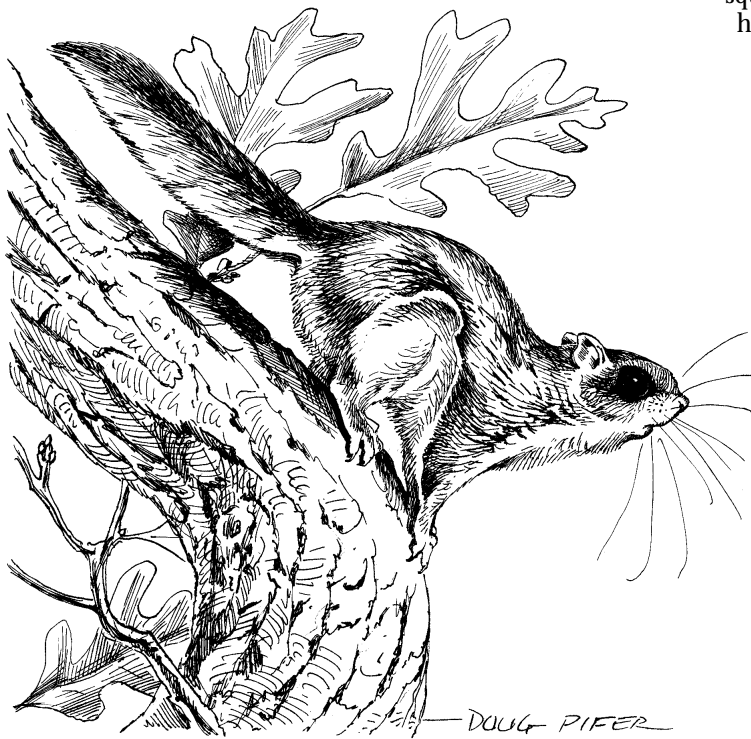
Flying squirrels may be more common than many people think. A good way to look for them is to rap a stick against trees or branches that have cavities; the squirrels may stick their heads out or emerge to see what's going on.

Flying squirrels eat nuts; seeds; winter buds of hemlock, maple and beech; tree blossoms and sap; fruits; berries; ferns; and fungi, both above-ground and subterranean types. They store surplus nuts in their dens and also bury them in the ground. Although small and apparently docile, flying squirrels are the most predaceous of the tree squirrels eating moths, beetles, insect larvae, spiders, birds and their eggs, small mice and shrews and carrion. Owls and house cats are major predators of flying squirrels; foxes, coyotes, weasels, skunks, raccoons and black rat snakes also take them. The average life span is estimated at five years.

Active year-round, flying squirrels are quite sociable, and in cold weather several individuals may share a tree cavity, sleeping snuggled together for warmth; up to 50 southern flying squirrels have been found in one nest. The southern flying squirrel may become torpid during the coldest part of the winter. One to three individuals typically live on an acre of suitable wooded habitat.

Northern Flying Squirrel (*Glaucomys sabrinus*) — The northern flying squirrel is slightly darker and browner than its southern counterpart. The two species' ecology and habits are similar, although the northern flying squirrel shows a greater affinity for conifers, and the southern flying squirrel favors nut-producing hardwoods. The





northern flying squirrel inhabits New England as far south as the mountains of northern Pennsylvania; there are also disjunct populations in parts of the Appalachians to the south. *Glaucomys sabrinus* ranges from the Great Lakes states west to Alaska.

Northern flying squirrels inhabit old-growth and mature forests, particularly northern hardwoods (beech, birch, maple) interspersed with hemlock, spruce and fir. Home ranges are estimated at 5 to 19 acres and perhaps larger. Adults do most of their foraging between dusk and midnight, and for one to three hours before dawn. They feed heavily on lichens and fungi, including many underground ones, truffles and their relatives, which the squirrels sniff out. They also eat seeds, buds, fruits and insects. They den in tree cavities or woodpecker holes during the winter, and in the summer, they may build nests out of leaves and shredded bark, in crotches of conifers high above the ground. Females produce one litter per year, usually with 2 to 4 young.

The loss and fragmentation of old-growth forest may be causing a decline in the northern flying squirrel population in Pennsylvania, and it is considered a threatened species here.

Population

Once there were so many gray squirrels in Pennsylvania that they were considered nuisances by pioneering farmers. In fact, bounties were paid on 640,000 squirrels in 1749, and many more were doubtless taken for the table.

Settlement and development of our state has changed the habitat, and squirrel numbers have decreased since the 18th century — but even so, there is no shortage of

squirrels in Pennsylvania today. They're our most heavily harvested small game species.

Biologists estimate that a healthy autumn squirrel population is composed of about 35 percent juveniles, 30 percent sub-adults and 35 percent adults; also, that one gray squirrel per acre of woodland is a good density and that three per acre is excellent and only occurs on prime habitat. Although a hundred or more squirrels may thrive in a park or campus, these situations do not occur in the wild. If food becomes scarce in the wild, large segments of the gray squirrel population may leave their home locales to travel in search of food and concentrate where they find it.

Squirrel populations fluctuate. Good reproduction — with most females bearing two litters — follows autumns in which large mast crops were produced. Severe winters, on the other hand, may reduce squirrel numbers, especially if they follow a mast failure.

Habitat

Woodland areas can be managed to favor squirrels. Of the two main forest types found in Pennsylvania — oak-hickory in the south and beech-birch-maple in the north — the oak-hickory forest is better squirrel habitat, mainly because it has a greater variety of vegetation types.

Gray squirrels prefer a deciduous forest with a variety of tree species that provide a diverse food supply. A forest of mixed maples, oaks, hickories and beech, for instance, would support more grays than would a ridge-top stand of chestnut oaks. The fox squirrel needs woodland edge — places where the trees border corn or other crop fields.

A good squirrel woods should contain many mature mast-producing trees, a mixture of other tree and shrub species to provide seasonal food variety, natural den trees and hollow tree cavities for escape purposes. Diverse tree and shrub species ensure adequate food supplies even though weather, tree characteristics or tree vigor may cause food crop failure of some types of vegetation.

Red, black and scarlet oaks regularly produce mast, while white and chestnut oaks are less reliable. Although white oak makes better sawtimber, landowners favor the red oak group if they wish to support a large, stable squirrel population. In selective logging operations, four to six hickories should be left per acre (if they are available), as they are heavy mast producers.

Old, hollow trees with many openings are rarely used for dens, although they provide temporary shelter from predators and hunters. A good den site is usually a tree nearing maturity with one or two openings into a cavity. Entrance holes are round and seldom over three inches in diameter. If you want to manage a timber tract for squirrels, keep at least four or five active den trees on each acre. In forests where trees have reached a mast-producing stage but are not mature enough to serve as good den sites, artificial nesting boxes may be used.

Wildlife Notes

Allegheny Woodrat	Opossum
Bats	Otter
Beaver	Owls
Black Bear	Porcupine
Blackbirds, Orioles, Cowbird and Starling	Puddle Ducks
Blue Jay	Raccoon
Bobcat	Rails, Moorhen and Coot
Bobwhite Quail	Raptors
Canada Goose	Ring-necked Pheasant
Chickadees, Nuthatches, Titmouse and Brown Creeper	Ruby-throated Hummingbird
Chimney Swift, Purple Martin and Swallows	Ruffed Grouse
Chipmunk	Shrews
Common Nighthawk and Whip-Poor-Will	Snowshoe Hare
Cottontail Rabbit	Sparrows and Towhee
Coyote	Squirrels
Crows and Ravens	Striped Skunk
Diving Ducks	Tanagers
Doves	Thrushes
Eagles and Ospreys	Vireos
Elk	Vultures
Finches and House Sparrow	Weasels
Fisher	White-tailed Deer
Flycatchers	Wild Turkey
Foxes (Red & Gray)	Woodchuck
Gray Catbird, Northern Mockingbird and Brown Thrasher	Woodcock
Hérons	Wood Duck
Kingfisher	Woodpecker
Mallard	Wood Warblers
Mice and Voles	Wrens
Minks & Muskrats	
Northern Cardinal, Grosbeaks, Indigo Bunting and Dickcissel	

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Wildlife Note — 23
LDR0603

Striped Skunk



by Chuck Fergus

The striped skunk (*Mephitis mephitis*) belongs to the mustelid family, which includes weasels, ferrets, martens, fishers, mink, otters and badgers. Three other skunk species live in the United States: hooded and hognose skunks, which inhabit the Southwest; and the spotted skunk, found over much of the country, but in the East, north only to southwestern Pennsylvania.

The species commonly found in Pennsylvania is the striped skunk. Widespread, it occurs in all 48 contiguous states, southern Canada, and northern Mexico, from sea level to timberline in suitable habitat. The word “skunk” comes from the Algonquin Indian name for the animal, *seganku*. Other names include polecat and the French Canadian *enfant du diable*, or “child of the devil.”

Biology

Adult skunks are about two feet long, including a 7- to 10-inch tail. They weigh 3 to 12 pounds, depending on age, sex, physical condition and time of year. Males on average are 15 percent larger and heavier than females.

Skunks have small heads, with small eyes and ears and a pointed nose; short legs; and wide rear ends. The bottoms of their feet are hairless, like those of bears or raccoons. And, like these two other mammals, skunks walk in a plantigrade manner — on the soles of their feet with heels touching the ground. The claws of a skunk's forefeet are long and sharp, well-adapted to digging.

A skunk is colored black and white. Its body is often mostly black, with white occurring in a narrow blaze up the middle of its forehead; a broad patch on the back of its head, and a V-shaped mark over its shoulders, which forms stripes that continue along the animal's back, often uniting at the base of its tail. Stripes vary in length and width among individuals. The tail is bushy and black, usually tipped white. Sexes are colored and marked alike.

A skunk's pelt is composed of soft, wavy underfur overlain with long, coarse guard hairs. Skunks molt yearly, beginning in April and ending some time in September.

Skunks make a variety of sounds, including hisses, growls, squeals, soft cooings and churrings.

By nature, skunks are placid and sluggish.

They move at a deliberate walk, slow trot or clumsy gallop; their top speed is about 10 miles per hour. They can swim, but are poor climbers. Their senses of sight, smell and hearing have been judged poor to fair compared with those of other wild mammals; their sense of touch, however, is acute.

Skunks are armed with a potent defensive weapon: a pair of large scent glands found beneath the skin on either side of the rectum. These glands have nozzle-like ducts, which protrude through the anus. Skunks discharge their scent, or musk, through these nozzles, powering the stream with a strong hip muscle contraction.

Musk is an oily liquid, creamy or yellowish in color. Its active ingredient is a sulphide called mercaptan. Field guides refer to the musk as “highly repellent to all mammals.” In short, it stinks. Musk can make a predator sick or, if the skunk has been able to direct the substance into the animal's eyes, temporarily blind.

A skunk can shoot musk about twelve feet, but will use it as only a last resort, preferring, instead, to bluff an enemy. If threatened, a skunk drums its forefeet on the ground, snarls, arches its back and raises its tail. It can spray in any direction by twisting its rump toward the target. And, contrary to popular opinion, it can discharge when hoisted by the tail.

Striped skunks are omnivorous. What they eat depends on where they live and what's available. In summer, they feed heavily on insects — adult and larval forms — including grasshoppers, crickets, beetles and wasps. (Pest insects eaten: potato bugs, tobacco worms and Japanese beetles.)

Skunks dig out bumblebee nests and scratch at the entrances of beehives, catching and eating any honeybees that fly out. Frequently they leave evidence of their



feeding: small, cone-shaped holes in the soil, pine needles, leaf duff or suburban lawns mark where they've dug for grubs. Other summer foods: spiders, toads, frogs, lizards, snakes, mice, chipmunks and the eggs of turtles and ground-nesting birds.

In fall and winter, skunks eat fruit such as wild grapes and cherries; small mammals such as moles, mice, voles and shrews; plant items such as grasses, leaves and buds; mast and carrion. Chiefly nocturnal, they hunt from dusk until dawn.

They den in ground burrows, beneath buildings, stumps, wood and rock piles and overhanging creek banks. Often a skunk will use an abandoned woodchuck burrow, although if none is available it will dig its own. The burrow has a central chamber (12 to 15 inches in diameter) about three feet underground, connected to the surface by one or more tunnels 5 to 15 feet long. The central chamber is lined with dry grass and leaves. Skunks seem to prefer slopes for den sites, probably because these areas drain well. In spring, summer and early fall, a skunk may den in several different burrows; in winter, it tends to use just one.

Normally solitary, males and females get together for breeding in February and March. Males fight with each other, although they rarely discharge musk during these conflicts. They travel widely in search of mates and breed with several females if possible.

A mated female drives off males shortly after her 3-day estrus period ends. After 60 days' gestation, she bears 2 to 10 young (usually 5 to 7). Skunks are capable of breeding in their first year. Younger females may bear fewer young and give birth later in the year than older females.

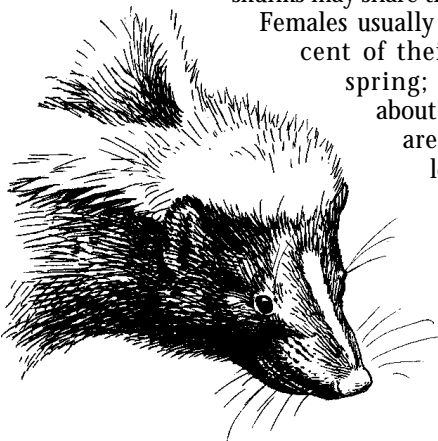
At birth, striped skunks weigh less than an ounce. Although they're blind and unfurred, the pattern of their future black-and-white pelage shows on their pinkish, wrinkled skin. They develop quickly. After three weeks, their scent glands become functional; at four weeks, their eyes open; and at about two months the young are weaned and ready to leave the den for nighttime hunting forays.

By November, young of the year are as large as adults. While family ties are usually broken in August or September, some mothers over-winter with their offspring. Community dens have been found containing 12 or more skunks, mostly females and young.

Skunks do not hibernate, although they may remain dormant underground all winter. Their body temperature remains near normal. Several skunks may share the same winter den.

Females usually lose 10 to 30 percent of their body weight by spring; males lose only about 10 percent, as they are more inclined to leave their dens and feed during mild spells, mostly at night but occasionally during the day.

The great horned owl,



which lacks a well-developed sense of smell and apparently is not bothered by the skunk's musk, is a predator. Dogs, foxes, coyotes and bobcats take an occasional skunk, but the skunk's potent musk warns off most predators.

Other mortality factors are diseases such as pneumonia, distemper, pulmonary aspergillosis, tularemia, brucellosis and rabies; highway kills, starvation and trapping. Skunks are host to fleas, lice, mites, ticks and various internal parasites. Most skunks live two to three years in the wild; in captivity, they have lived 10 years.

Population

Striped skunks live throughout Pennsylvania. Highest numbers are found in farming areas; lowest populations occur in densely forested mountain regions. Wildlife researchers have estimated an average of one skunk per 10 acres of prime habitat and 13.5 skunks per square mile of agricultural land.

Mephitis mephitis has proven highly adaptable. Along with the woodchuck, raccoon, Canada goose, mourning dove, several species of blackbirds and other wildlife, the skunk prospers wherever humans clear land for farming and remove or drive out larger predators.

Skunks can live in an area for years and, because of their nocturnal habits, remain unseen — although perhaps not “unsmelled” — by most people. Some farmers welcome their presence, realizing that these small predators eat many pest insects and rodents.

Skunks are susceptible to distemper and rabies. Trapping may help minimize the impacts of disease on a skunk population. Local populations are also affected by severe weather, food scarcities and habitat change.

Habitat

Skunks live in a variety of habitats. They favor mixed woods and brushland, rolling weedy fields, fencerows, wooded ravines and rocky outcrops in or near agricultural areas. For day retreats (resting cover), they use hayfields, pastures, fencerows and brushy borders of waterways. Cornfields are good feeding areas, where skunks forage for grasshoppers, grubs and beetles; high corn plants also protect young skunks from airborne and land predators without impeding their movements.

Although they may cover several miles each night while hunting, established individuals rarely wander more than a half-mile from their home burrows. In general, adults range more widely than juveniles, males more widely than females.

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Wildlife Note — 56
LDR0103

Tanagers

By Chuck Fergus

Two tanager species migrate north from the Neotropics to breed in eastern North America. This is but a small percentage of the more than 200 species in the tanager subfamily Thraupinae, many of whose members sport dazzling colors. The word tanager comes from a South American Indian word denoting a small, brightly colored bird. In tropical forests, mixed feeding flocks may include more than a dozen species, in plumages of red, yellow, green, blue and purple.

Scarlet Tanager (*Piranga olivacea*) — The brightest red I've ever seen met my vision when I focused binoculars on a male scarlet tanager singing in a treetop: Against a backdrop of dark clouds and lit by the last rays of the evening sun, he looked positively fluorescent. Males arrive on the breeding range (eastern North America from southern Canada to the Carolinas) in late April and early May, just as trees are beginning to leaf out. Their bodies are red, and their wings and tails are jet black. Females, which show up a few days later, are a greenish yellow that blends with the leaves in which they rest and feed. Adults are about seven inches in length.

Scarlet tanagers favor dry, upland oak woods. They also inhabit mixed and coniferous forests and shade plantings in suburbs and parks. Males claim two- to six-acre territories by singing almost constantly from prominent perches and driving away competing males. The song sounds like *jeeyeet jeeay jeeoo jeeeer jeeyeet*, five to nine slightly hoarse notes ("like a robin with a sore throat," said Roger Tory Peterson). Males whose territories adjoin sometimes perch along shared boundaries and countersing. Males return to previous years' territories, but it's thought that females lack this strong homing instinct, so they rarely take the same mate in succeeding years.

Insects and fruits form the bulk of the diet. Females forage higher in the tree canopy than males. Both sexes work slowly and methodically, inspecting leaves, twigs and branches and picking at leaf clusters near the ends



Scarlet Tanager

of twigs. Sometimes they make short flights to catch flying insects, particularly bees and wasps. They eat caterpillars, moths, adult and larval beetles, dragonflies, aphids, snails, spiders, worms and millipedes. During cold snaps they land on the ground and hunt for beetles, earthworms and other terrestrial prey. They also eat tender buds, wild fruits and berries, and cultivated fruits such as cherries.

Scarlet tanagers nest in late May and June. To rear a brood, a pair needs at least four wooded acres, with eight the optimum. During courtship the male flies to a perch below the female; he droops his wings and spreads his tail to show off his brilliant back. If the female strays outside his territory, he chases her back into it. Tanagers mate frequently, with the female crouching and calling to entice the male. She chooses the nest site and builds the nest herself, over three to seven days, while the male sings from perches at the mid-forest level. Tanagers nest lower than they forage; nests are 8 to 75 feet up (usually 18 to 50 feet), often near the end of a horizontal branch in an oak, with a view of the ground and with clear flyways from nearby trees. The nest is flattish and rather flimsy, made of twigs and rootlets and lined with grasses and stems; some nests are so loosely woven that the eggs can be seen from beneath. The female lays two to five eggs, usually four; they are pale blue-green marked with brown.

The female incubates them for about two weeks, with the male bringing food to her. Both parents feed insects and fruit to the young, which leave the nest after

9 to 15 days; their parents keep feeding them for two more weeks. Only one brood is produced each summer.

Fledglings are brown, with slight streaking. In late summer the adults molt, and for a while the male is a patchwork of red, yellow and green; he ends up looking like the female, but retains his black wings and tail. Scarlet tanagers leave Pennsylvania in September and early October.

They migrate mainly through the Caribbean lowlands of Middle America and spend most of the year east of the Andes in remote forests of Colombia, Ecuador, Peru and Bolivia. There they sometimes join mixed-species flocks and feed in the canopy (along with other tanagers) and in fruiting trees.

One scarlet tanager that had been banded lived for ten years; most, however, probably don't survive for half that long. They're preyed on by hawks, falcons and owls. Tanagers attack squirrels and blue jays, which, nevertheless, manage to rifle many nests. Crows also eat eggs and fledglings. Brown-headed cowbirds parasitize more than half of all tanager nests in some areas, particularly where the forest has been fragmented by logging or home development. Scarlet tanagers nest statewide in Pennsylvania and are more common than many people

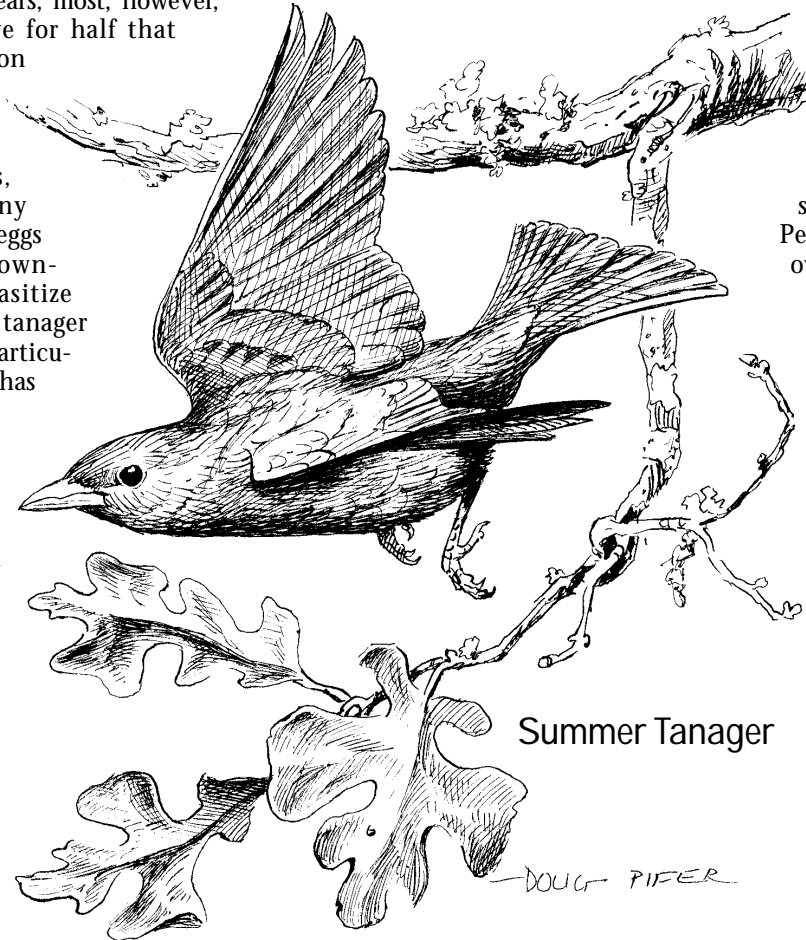
think. The highest populations occur in mature, extensive forests. Scarlet tanagers are absent from treeless urban areas and intensively farmed lands.

Summer Tanager (*Piranga rubra*) — This all-red tanager breeds mainly in the Southeastern U.S., where it is called the "summer redbird." Its range extends into southwestern Pennsylvania, and it is regularly found only in Greene County. *Breeding Bird Atlas* volunteers found it during the 1980s in Greene, Washington and Beaver counties. Summer tanagers inhabit dry upland forests, with a preference for slightly open oak woods. In summer they eat mainly insects: caterpillars, moths, beetles, cicadas, grasshoppers, flies and others; often they tear open wasp nests to feed on larvae, apparently without

being stung. The summer tanager's breeding and nesting habits are similar to those of the scarlet tanager.

Some individuals seen in springtime in Pennsylvania may have overshot their normal range and may then turn around and move back south to find mates.

Summer tanagers spend most of the year on a large range that extends from central Mexico to Bolivia and Brazil.



Summer Tanager

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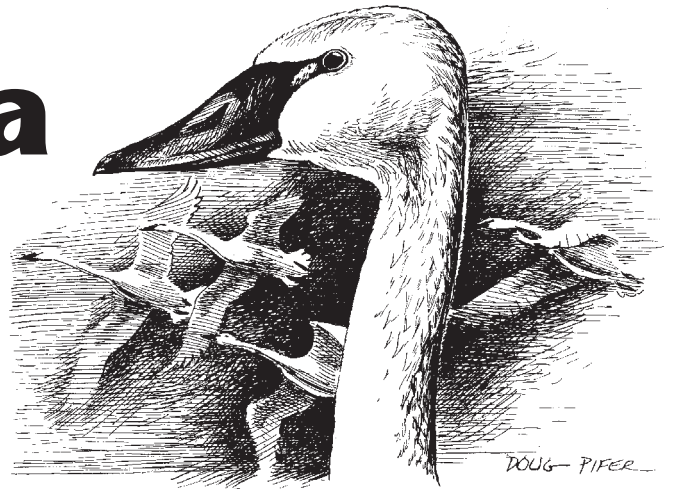
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Wildlife Note — 61
Ldr1204

Tundra Swan

By Chuck Fergus



Have you hiked along a lake or river in early spring and seen flocks of white, long-necked swans resting or feeding in the shallows? Chances are good that those graceful, majestic birds were tundra swans. The tundra swan (*Cygnus columbianus*), formerly known as the whistling swan, breeds in northern Alaska and Canada and migrates south to winter along and near the Pacific and Atlantic coasts. Tundra swans fly across Pennsylvania in spring and fall, and some winter in the southeastern part of the state. Our only other swan is the mute swan (*Cygnus olor*), originally imported from Europe and now here in domestic and feral populations.

Biology

The tundra swan — 4 to 5 feet long and with a wingspan of about 66 inches — is markedly smaller than the mute swan. Adult tundra swans weigh 10 to over 18 pounds, with males somewhat larger than females. The plumage is white, and the sexes look alike. The bill and the front portion of the face are black (the mute swan has an orange bill with black knobs at the base). Most adult tundra swans have a yellow spot in front of the eye. The legs are black. The neck is held straight up most of the time (the mute swan, in contrast, usually keeps its neck in a curved position).

Whether taking off from water or land, before a tundra swan can become airborne it must take many running steps. Individuals can fly up to 50 miles per hour. The flight call consists of one to three syllables, usually described as variations of the sounds *ou*, *oh*, and *oo*; the voice of a tundra swan sounds similar to that of a Canada goose. Parents and young make softer *kuk kuk* sounds to communicate at close range.

Tundra swans are good swimmers, propelling themselves with their webbed feet. They are able to dive beneath the water if necessary.

As their name implies, tundra swans breed in the treeless tundra of northern Alaska and Canada's Northwest Territories, Nunavut, northeastern Manitoba, northern Ontario, and northwestern Quebec. The highest breeding concentrations occur in the river deltas of Alaska and the Northwest Territories. Swans that breed east of Point Hope in northern Alaska winter on the Atlantic coast, while birds breeding from Point Hope south winter along the Pacific.

On their northern breeding range, tundra swans eat a variety of plants, including sedges, pondweed, pendant grass, arrowleaf, and algae, consuming seeds, stems, roots, tubers and some invertebrates. While floating on the water, tundra

swans feed by dabbling with their bills. They also tip their tails up, submerge their heads, and extend their necks to nip off vegetation as deep as 3 feet below the surface.

Males and females form life-long pair bonds. On the breeding range, a pair maintains a territory in which they feed, nest and rear young. The territory usually includes part of a large body of water, used for feeding and escaping from predators. A typical territory covers an area of about half a square mile. Young pairs may establish home areas a year or more before breeding. Each year, a pair will use the same territory, defending it against other tundra swans and waterfowl including Canada geese, white-fronted geese, snow geese and oldsquaws. When it encounters a competitor, a swan may hiss, stare, raise its wings and, using the wrist portion of its wings, deliver blows to the intruder.

The male and the female build a nest out of grasses, sedges, lichens and mosses, on the ground, usually on an island or a low ridge or some other spot providing good visibility. The mound-shaped nest is 1 to 2 feet across, with a depression in the center. A pair may reuse the same nest in successive years. Tundra swans court by facing each other, spreading and quivering their wings, and calling loudly. Mating takes place in the water. The female lays three to five (rarely as many as seven) creamy white eggs. She broods her clutch the majority of the time; the male broods only when she is absent. After 31 to 32 days, the eggs hatch. Pairs produce only one clutch per season; if the nest fails, the adults do not lay a second clutch.

Young swans, called cygnets, are light gray in color. Their eyes are open when they pip the shell. Their downy feathers dry out a few hours after hatching, and they begin walking about near the nest. Around 12 hours after the last egg hatches, the parents lead the cygnets to water. With the young swimming along behind, the adults use their feet to kick loose and churn up plants on which the cygnets feed. For about a week after hatching, the parents may brood the young. Tundra swans sleep almost exclusively on land during the breeding season; they stand or sit and may rest their head on their back or tuck it partway under a wing.

On the breeding grounds arctic foxes, red foxes, bears, wolves, eagles, jaegers, gulls and ravens prey on eggs and cygnets. Parents defend their eggs and young against smaller predators and usually flee their nest when a large predator,

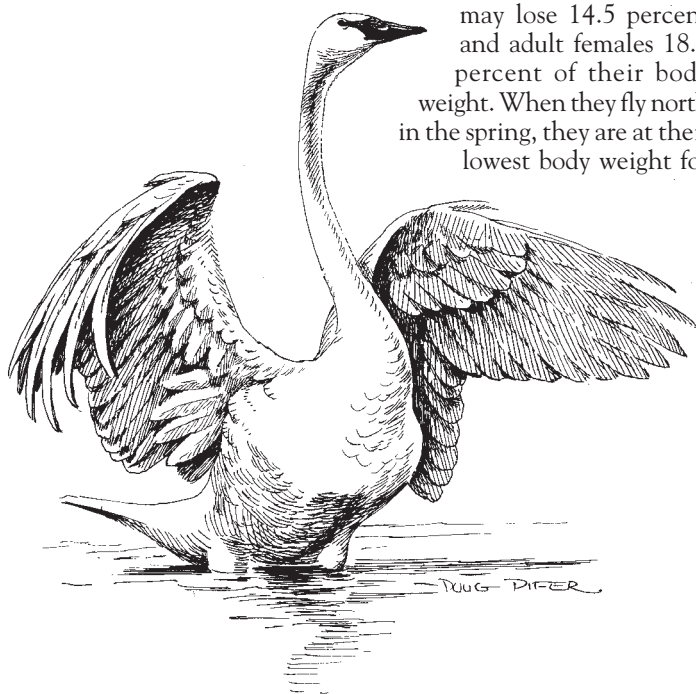
such as a bear or a human, is several hundred yards away; this strategy may make the nest harder to find. Adults molt their flight feathers during late summer. While molting, they cannot fly and, if threatened by a predator, will walk or run to a large pond or lake and swim out to the center.

Cygnets are able to fly after two to three months. As the northern summer dwindles, family groups vacate their home territories and fly to staging areas, mainly along brackish shores of river deltas, which remain free of ice longer than other arctic wetlands. In late September, flocks begin heading south. Flocks are composed of multiple family groups and can number more than 100 individuals. The swans fly in V-formations at altitudes of 1,800 to 4,500 feet and higher.

Flocks follow traditional inland migratory routes. The Eastern wintering population arrives in early October in the Devils Lake area of North Dakota and the upper Mississippi River in Minnesota. Later, flying by day and night, they make a nonstop migration of almost a thousand miles to wintering areas in coastal New Jersey, the Susquehanna River Valley in southern Pennsylvania, the Chesapeake Bay region, and coastal North Carolina. Some birds winter in the Great Lakes region. Tundra swans arrive at the wintering grounds from mid-November to mid-December. Banding studies indicate that individuals often return to the same wintering area year after year.

Tundra swans winter on shallow tidal estuaries and on freshwater lakes, ponds and rivers. In the past, tundra swans fed largely on submerged aquatic vegetation, as well as a small amount of animal matter, including clams. As aquatic plants have dwindled, due to the destruction of wetlands, wintering swans have shifted to feeding on land. They forage mainly in farm fields, picking up waste corn and soybeans left after the harvest, and eating crops such as winter wheat, rye, and barley. In winter, tundra swans spend the night floating and sleeping on the water. During the full moon, flocks may feed at night. They fly back and forth between resting and feeding areas.

Individual birds tend to lose weight over winter. Studies have shown that adult males may lose 14.5 percent and adult females 18.7 percent of their body weight. When they fly north in the spring, they are at their lowest body weight for



the year. Flocks leave wintering areas in mid-March and head north by stages. As much as 25 percent of the Eastern population stops in the Susquehanna River Valley, where they feed heavily and accumulate energy reserves for migration and breeding. They depart from the area in late March and move on to the next staging area in southern Ontario. They migrate through Wisconsin, Minnesota and North Dakota in April, and arrive on the arctic breeding grounds by mid-May. Although family groups depart from wintering areas together, parent birds arrive unaccompanied by their young.

Tundra swans are long-lived. The oldest known individual was a banded bird that lived at least 21 years. Scientists estimate that 92 percent of adults, 81 percent of juvenile males, and 52 percent of juvenile females survive each year. One study found a 52 percent survival rate for young eastern tundra swans during their first migration.

Habitat

During spring and fall migrations, tundra swans stop to rest and feed in estuaries, shallow ponds, lakes and marshes fringing rivers. They also set down in harvested fields and those in which winter grains are growing. The Arctic breeding habitat includes many lakes, ponds, pools and wetlands.

Wildlife biologists believe that migratory staging areas are important late winter and early spring habitats in which swans feed heavily and accumulate energy reserves for the coming breeding season. In Pennsylvania, most tundra swans winter along the lower Susquehanna River and at the Game Commission's Middle Creek Wildlife Management Area in Lancaster County. Many swans in the Eastern wintering population stage in these areas.

Population

During the late 1800s, the tundra swan population was at an ebb, probably because of unregulated shooting by market hunters. Following the 1918 Migratory Bird Treaty, numbers increased. *Cygnus columbianus* was thought to have been extirpated from breeding areas in the southern Hudson Bay region, but the species has recently begun nesting there again, along the coasts of Manitoba, Ontario and Quebec. Since the late 1960s, as aquatic plants have declined and mute swans (which compete for preferred habitats) have increased in number in the Chesapeake Bay, the number of tundra swans wintering on the Chesapeake has fallen. A greater percentage of the population now winters in North Carolina, where flocks feed extensively in agricultural fields.

Since 1984, some states have allowed a limited hunting season on tundra swans. In the East, North Carolina, and Virginia issue permits for hunting swans. At this time, no swans may be legally hunted in Pennsylvania. The U.S. Fish and Wildlife Service, which monitors populations of migratory birds, has established target population sizes of 80,000 tundra swans in the East and 60,000 in the West. Today the population of *Cygnus columbianus* is considered stable.

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Wildlife Note — 30
LDR0103

Vultures

by Chuck Fergus

Vultures, also called buzzards, are large, blackish birds with broad wingspans, often seen soaring in wide circles in the sky. They are active in the daytime, when they search for carrion to eat. Sometimes they perch in trees or stand on the ground, usually near a dead animal. Although graceful in flight, they are clumsy on the ground.

Seven species of vultures inhabit North America, including the endangered California condor. Pennsylvania has two species: the turkey vulture (*Cathartes aura*) and the black vulture (*Coragyps atratus*). The turkey vulture is by far the more common; it is found statewide, while the black vulture, more of a southern species, occasionally strays into southeastern Pennsylvania. Both are protected by game laws.

Turkey Vulture (*Cathartes aura*) — The turkey vulture is the chief avian scavenger of the United States, consuming huge quantities of unsanitary and (to human sensibilities) offensive carrion from roads, fields and forests. Three subspecies inhabit North America: the eastern (found in Pennsylvania); western; and Mexican turkey vulture.

Adults are about 30 inches in length, with wingspans up to six feet. Their bodies are covered with blackish-brown feathers, and sexes are colored alike. Seen from below, a turkey vulture's wings appear two-toned, the flight feathers lighter-colored than the rest of the feathering. Turkey vultures soar with wings held above the horizontal, forming a gently V. The birds rock and tilt on the air currents.

To probe deeply into carrion without becoming overly messy, the head and neck are unfeathered — “like the bare arms of a butcher,” wrote an early naturalist. Adults

have pink heads and necks; in young birds, these skin areas are blackish. The turkey vulture's heavy bill has a sharp hook at the end for tearing. Its toes are equipped with strong, curved talons.

Vultures are essentially voiceless; lacking a syrinx, or voice box, all they can do is hiss and grunt. They have keen vision and a sharp sense of smell, and use both to locate carrion. Their olfactory organs are large and well supplied with nerve endings.

Vultures are efficient soarers, their long, broad wings holding them aloft like kites.

In a rising current of air, a vulture can maintain or even increase altitude without flapping its wings. Since they don't use their wings as much as most birds, vultures have relatively small breast muscles. Like many hawks and falcons,

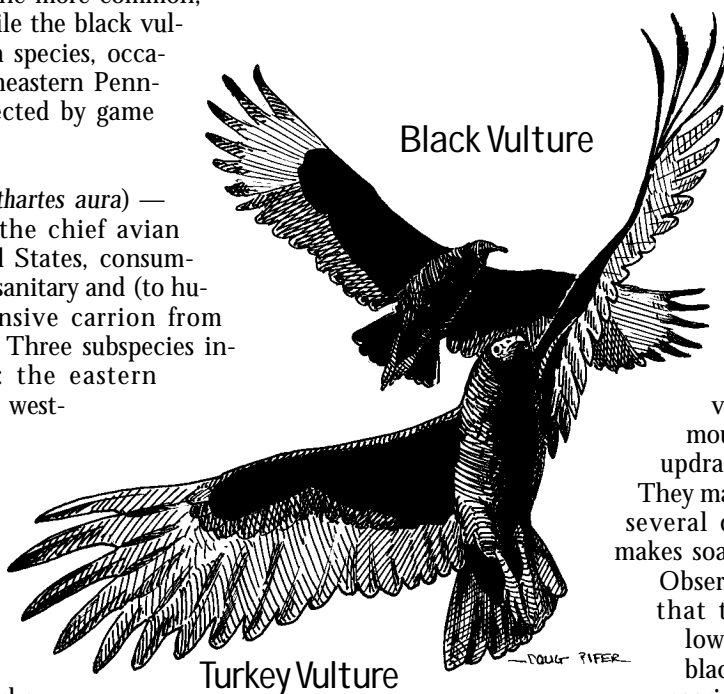
vultures migrate along mountain ridges, using thermal updrafts to help keep airborne.

They may remain on their roosts for several days when rainy weather makes soaring difficult.

Observations from gliders show that the turkey vulture has a lower sinking speed than the black vulture. This heightened soaring ability may have helped

the turkey vulture extend its range farther north than the black, which keeps more to the south, where the warmer sun generates abundant strong thermals.

Vultures eat all kinds of carrion, including fish, snakes, winter- and highway-killed mammals, domestic animals, and slaughterhouse refuse. Both captive and wild turkey vultures have been observed killing smaller birds.



Favored breeding habitat includes remote areas inaccessible to predators, such as caves, steep cliffs, hollow logs or stumps or dense thickets. (Unusual nesting sites: abandoned farm buildings; the snag of a dead tree with an entrance 14 feet above the nest; six feet below ground level in a rotted stump; and a cavity in a beech tree 40 feet above the ground.)

Vultures make little or no nest, depositing their eggs on the ground, in gravel on cliff ledges, or on rotted sawdust or chips in logs and stumps.

The female lays one to three eggs, typically two. Eggs are $2\frac{3}{4}$ by $1\frac{3}{4}$ inches, elliptical or long-oval. Their shells are smooth to slightly grainy, dull or creamy white, overlain with irregular spots and blotches of pale and bright brown.

Both parents share incubating. After 30 to 40 days, the eggs hatch into altricial young that remain in the nest for about four weeks. The young birds eat carrion regurgitated to them by their parents. Careful concealment or an inaccessible nest is important at this time, as the carrion's stench may attract potential predators.

Vultures are gregarious; groups of eight to 25 or more adults and juveniles may wheel in the sky or roost together in trees. Although turkey vultures like to nest in caves, they apparently rarely enter them at other times of the year and do not use them for winter shelter. Both young birds and adults molt once each year, from late winter or early spring until early fall.

The turkey vulture is a year-round resident of Pennsylvania. It is a common migrant in late February and March. In summer, it breeds throughout the state. In fall, it passes through during September and October, with stragglers into early November. *Cathartes aura* winters

in the southeastern counties (Adams, Berks, Bucks, Chester, Cumberland, Delaware, Franklin, Lancaster, Lehigh, Montgomery, Northampton, Philadelphia and York), and occasionally in the southwestern counties (Fayette and Greene). Most turkey vultures winter in the southern United States, Central America and South America.

Black Vulture (*Coragyps atratus*) — The black vulture, about 24 inches in length, with a wingspan less than five feet, is smaller than the turkey vulture. The black has a short tail and black head. Because its wings form less sail area, it is not as efficient at soaring as the turkey vulture, and must fly using several rapid wing flaps followed by a short sail.

Airborne, the black vulture shows distinctive white patches on the undersides of the wings near the tips. The black holds its wings more horizontally than the turkey vulture. In both species, their naked heads look so small for the size of the bird that from a distance they sometimes appear almost headless.

The black vulture strays into, but is uncommon in, these southeastern Pennsylvania counties: Adams, Berks, Bucks, Chester, Cumberland, Franklin, Lancaster, Perry and York. It has nested in Adams and York counties.

Behavior, food, and nesting habits of the black vulture are similar to those of the turkey vulture. Eggs, usually two per clutch, are slightly larger than turkey vulture eggs, and are grayish-green, bluish-

white, or dull white, with brown blotches and spots. Incubation (by both sexes) takes 28 to 39 days. For unknown reasons, black vultures sometimes litter their nest areas with bright bits of trash, such as bottle caps and broken glass.



Turkey Vulture

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Wildlife Note — 26
LDR0603

Weasels

by Chuck Fergus



Weasels are mammals belonging to the family Mustelidae. The mustelids, which are characterized by strong musk, vary in size, color, behavior and habitat. They are found worldwide, except for Antarctica and most oceanic islands. Other Pennsylvania mustelids are the striped skunk, mink, otter and fisher. Ferrets, badgers and wolverines also belong to the family.

Three weasel species occur in Pennsylvania: the ermine, also called the short-tailed weasel, Bonaparte's weasel, and stoat; the long-tailed weasel, also known as the New York weasel; and the least weasel, or mouse weasel. Ranges of the three species overlap in Pennsylvania, the Great Lakes states and parts of Canada. In Pennsylvania, the ermine is found mostly in the northern and eastern parts, the long-tailed is common throughout the state, and the least is found in greatest numbers in the southcentral and northwest.

Weasels have long, slim bodies. Their short legs have five small-clawed toes on each foot. Their necks are long, their heads small and triangular; eyes are small in relation to head size, and the ears, set low on the skull, are rounded and well-furred. Weasels travel with a loping gait, stopping occasionally to sit on their haunches or stand on their back legs to look around.

Weasels are consummate predators. Their senses of sight, smell and hearing are acute, their hunting instinct is keen, and they are active, aggressive and quick. They kill and consume a wide variety of prey, including animals larger than themselves. Small rodents form the bulk of most weasels' diets. Although mainly nocturnal, weasels may hunt during the day.

They find prey mainly by scent, darting in and out of rodent burrows, checking brushpiles and rock crevices. A weasel pounces on its prey and bites it at the base of the back of its skull; the weasel's forelegs hug the prey, and the hind legs kick and scratch.

A weasel has a fast metabolism and must eat more food in proportion to its body weight than other mammals of similar size. Males are typically larger than females; some biologists believe this size difference may lead males to

concentrate on larger prey, relieving feeding competition when prey species are scarce.

Secretive and wary, weasels are difficult to study in nature, and many gaps remain in our knowledge of their reproduction. Two of the species covered in this Wildlife Note (the ermine and the long-tailed weasel) exhibit delayed implantation, common in mustelids. In delayed implantation, mating takes place in summer or autumn; the fertilized eggs go through a short period of development and then lie dormant within the female until spring, when they implant themselves in the uterine wall and continue to grow. About 25 days later, young are born.

Delayed implantation has two possible adaptive advantages: It assures that all litters arrive at a time when prey is abundant and competition for food is not extreme. Additionally, it doesn't restrict mating to one short period, increasing the odds that females will come in contact with males and be bred. Female weasels give birth to 4 to 12 young, usually in underground nests. Least weasels are thought to produce several litters each year, while ermines and long-tailed weasels bear one litter in April or May. Young of all species are born blind and naked or sparsely furred. Adult males may bring food to the mother and nursing young, which develop rapidly and are on their own after weaning.

Weasels remain active year-round, seldom denning for long periods regardless of weather. During spring, summer and fall, their fur is brown with creamy or white underparts. In Pennsylvania, most or all ermines change from brown to white for winter, and perhaps one in six long-tailed weasels turn white. Some least weasels undergo the brown-to-white transformation, which is triggered by shortening days.

Ermine (*Mustela erminea*) — The ermine is found in northern regions around the world. In North America, it occurs from Pennsylvania and Maryland north to New England, west across the Great Lakes states and Canada, from western Montana south in the Rocky Mountains to New Mexico, and from northern California north to Alaska. Although present throughout Pennsylvania (ex-



cept perhaps in the southwestern corner), the ermine is much scarcer here than the closely related long-tailed weasel.

Adults are 9 to 15 inches in length, including a 1.6- to 3.2-inch tail; males are larger and heavier than females. Weights are 1.6 to 3.7 ounces. Both sexes are smaller than corresponding sexes of the long-tailed weasel; a large male ermine is about the same size as a small female long-tailed. The ermine's bushy tail is shorter than that of the long-tailed weasel.

An ermine's pelt consists of soft, short underfur and long, coarse, glossy guard hairs. The sexes are colored alike, and immatures are similar to adults. Albinos are rare.

In summer, an ermine's upper-parts are dark brown, slightly darker on the head and legs. The chin and throat are white, and the underparts are white or cream-colored, extending down the insides of the legs and including the feet. The end third of the brown tail is black. In winter an ermine is white, tinged with yellow on the underparts and back. The tail tip remains black.

An ermine molts twice a year, in spring and autumn. The molts are triggered not by temperature but by amount of light per day, increasing in spring and decreasing in fall. Molts usually begin on the belly and spread to the sides and back, finishing with the tail. Aside from the varying hare, the weasels are the only Pennsylvania animals to turn white in winter.

The autumn molt (brown to white) begins in October and is usually complete by late November or early December. A molting ermine looks mixed brown and white. The white-to-brown spring molt runs from mid-March to late April.

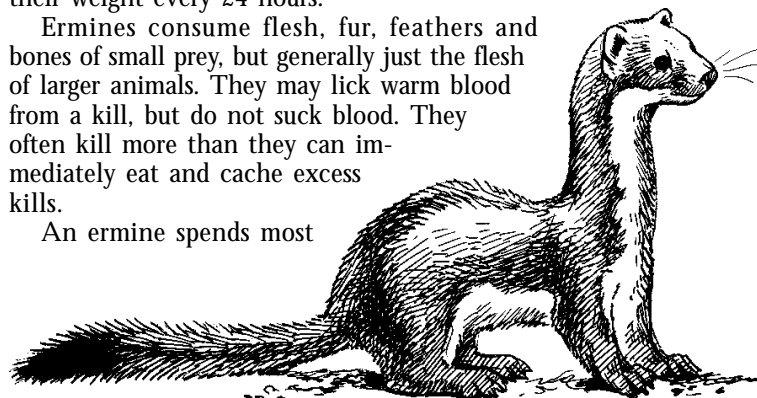
Like all weasels, ermines are alert, curious and bold. They make a rapid *took-took-took* sound, hiss, purr, chatter, grunt and screech. When annoyed, they stamp their feet or emit musk from their anal scent glands.

Ermines can swim (sometimes pursuing prey in water) and climb trees, but spend most of their time on the ground. Their normal gait is a series of short bounds (about 20 inches), made with back arched. An ermine can leap five or six feet and run about 8 mph for short distances.

Prey includes mice, voles, rats, chipmunks, shrews, cottontail rabbits, frogs, lizards, small snakes, birds, insects and earthworms, and carrion when hunting is poor. Captive ermines eat food equal to about one third of their weight every 24 hours.

Ermines consume flesh, fur, feathers and bones of small prey, but generally just the flesh of larger animals. They may lick warm blood from a kill, but do not suck blood. They often kill more than they can immediately eat and cache excess kills.

An ermine spends most



Long-Tailed Weasel

of the daytime in a den beneath a stone wall, rock pile, log, fallen tree, or abandoned building. A den may have three or four tunnels leading to it.

Breeding habits are similar to those of the long-tailed weasel. Females — including young of the year, 2 to 3 months old — come into heat in summer. (Males do not mature sexually until late winter or early spring following the year they were born.) Young are born from mid-April to mid-May, after a gestation period of about nine months due to delayed implantation.

The natal nest is underground, lined with leaves, grasses, fur and feathers. The female bears 4 to 9 young, usually 6 to 7. Newborns are blind, pink and weigh about half an ounce.

Young develop rapidly. Their eyes open at 35 days; they are lightly furred and play with each other inside and outside the den at 45 days. The male may help the female care for them. A 7-week-old male is larger than its mother.

Ermines are preyed on by man, large hawks and owls, foxes, snakes and domestic cats and dogs; they are parasitized by fleas and intestinal worms. Longevity is estimated at five or six years.

An ermine's home range is thought to be about 30 to 40 acres, and 20 individuals have been found per square mile of good habitat. In winter and early spring, ermines travel long distances for food, often 2 to 3 miles per night.

In the northern part of its range, *Mustela erminea* lives in low brush and thickets along waterways in heavily forested areas. To the south, ermines inhabit open country with fencerows and rockpiles, brushy land and, occasionally, swamps.

Long-Tailed Weasel (*Mustela frenata*) — The long-tailed weasel is found from sea level to timberline from Maine across the United States and southern Canada, south to Florida, Mexico and South America, excluding the U.S. Southwest. Pennsylvania's largest weasel, it is fairly common statewide; during years when Pennsylvania paid a bounty on weasels, eight of every 10 turned in were long-tails.

The long-tailed weasel is similar to the ermine in proportion, color and markings, although the long-tailed species is slightly larger and its tail is longer.

Adult males are larger and heavier than females. Length varies from 15 to 23.5 inches, including a 3.2- to 6.3-inch tail; weights are 2.5 to 9.3 ounces. Sexes are colored alike. In summer, upper parts are a uniform dark brown, extending onto the feet and toes (feet and toes



Ermine

of an ermine are white). The dark brown tail is tipped black.

The long-tailed weasel normally becomes white only in northern sections of its range; in Pennsylvania, five of every six stay brown in winter, and farther south all individuals probably remain brown.

Two molts occur each year. The fall molt is from October into November, the spring molt from mid-February or early March into April. In autumn, molting starts on the belly and moves upward; in spring, the order is reversed.

Behavior of the long-tailed weasel is similar to that of the ermine. Long-tailed weasels are good swimmers and adept climbers that will chase a squirrel up a tree. Although generally solitary, two individuals may play together. A long-tailed weasel is a persistent, efficient predator, chasing prey, pouncing on it, hugging it with the forelegs, and biting the victim at the base of the skull.

Prey: small terrestrial mammals, bats, hares, rabbits, birds and their eggs, frogs, snakes, earthworms, insects and carrion; smaller victims are eaten whole. A weasel can drag prey much heavier than itself.

A long-tailed weasel seldom digs a den, preferring to modify a chipmunk burrow, enlarge a hole under a stump, or move into a hollow log or a crevice in rocks, stone walls, or beneath an abandoned building. Nests are located about six inches underground and two feet from burrow entrances. Roughly nine inches in diameter, they are made of grass packed in layers and lined with shrew and mouse fur.

Breeding season is July and August, and young are born the following April or May after a 205- to 337-day gestation (average is 279 days). Delayed implantation occurs, with development of the eggs resuming during the last 27 days of pregnancy. One to 12 young may be born (average, 6 to 8).

Newborns are about 2½ inches long and weigh 0.11 ounces. They are blind, naked and pink-skinned, and tend to make more noise in the nest than young ermines. The male brings food to mother and young. Young develop quickly. After 21 days, their backs are well-furred; at 28 days, teeth erupt; at 36 days, their eyes open and the female begins weaning them. Soon after, the young leave the nest and disperse, and by November are almost fully grown.

Females breed in their first autumn, while males do not mature sexually until the following year. Man, foxes, dogs, hawks and owls prey on long-tailed weasels; captive specimens have lived five years, but wild individuals probably do not survive that long. *Mustela frenata* lives in open woodlands and brushy fields, preferably near water. Rocky fencerows are favorite hunting grounds. Size of an individual's range would vary with food availability and type and quality of cover.

Least Weasel (*Mustela nivalis*) — The least weasel is the world's smallest carnivore. It is found in Europe, northern Asia and North America. On our continent it inhabits the Appalachian Mountains from Pennsylvania south to North Carolina, the northern Midwest, Canada and Alaska (it's absent in New England and the Pacific Northwest). In Pennsylvania, *Mustela nivalis* is most common in the Allegheny Plateau area of our northwest and in the southcentral part of the state.

Least weasels are 6 to 8½ inches long, including a 1½-inch tail. They weigh 1 to 2 ounces. Males are slightly larger and heavier than females. Coloration is brown above, white below. The chin and feet are white, and the brown tail has no black tip. Sexes are colored alike. In Pennsylvania, some least weasels turn white in winter; in Canada, most or all individuals change into white pelage, including the tip of the tail.

Least weasels are just as aggressive and predatory as the larger weasels and kill in the same manner. If disturbed near its nest, an adult least weasel will chirp at its enemy. The chirp is a threat cry; least weasels also hiss (when afraid or threatened) and trill (in friendly encounters with other least weasels). When agitated, they spray musk from their anal scent glands.

The species preys on mice, voles, small birds, insects, earthworms and small amphibians. Sometimes they kill

more than they can eat and cache uneaten prey in their dens. Least weasels are nocturnal, solitary and are seldom seen; they spend most of their time hunting and consume food equaling 40 to 50 percent of their body weight each day.

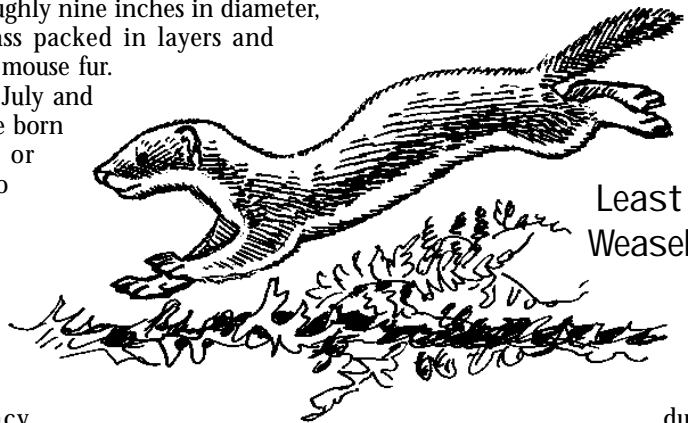
Least weasels breed and reproduce year-round, with the possible exception of winter. Delayed implantation does not occur, and two or more litters may be produced each year. A female's estrus

lasts four days. If bred, she bears 1 to 6 young (usually 4 to 5) following a 35-day gestation period.

Young are blind and naked, but develop rapidly. Hair covers their bodies in four days; canine teeth erupt at 11 days; eyes open at 26 to 30 days; and weaning occurs between 42 to 49 days, after which they are on their own. Immatures reach adult length after about eight weeks, and adult weight when 12 to 15 weeks old. Females mature sexually in four months, males in eight.

Least weasels inhabit meadows, fields, brushy land, or woods. They may take over nests and burrows of mice, moles and voles, lining them with fine grass or fur; in winter, the fur lining may be an inch thick and matted like felt. Least weasels rarely travel more than 100 yards from their home burrows, and the average individual range is estimated at two acres.

This tiny weasel occupies a lower position in the food chain than ermines and long-tailed weasels. It is preyed on by the larger weasels, snakes, owls and cats. Longevity in the wild is not known.



Least Weasel

Wildlife Notes

Allegheny Woodrat	Opossum
Bats	Otter
Beaver	Owls
Black Bear	Porcupine
Blackbirds, Orioles, Cowbird and Starling	Puddle Ducks
Blue Jay	Raccoon
Bobcat	Rails, Moorhen and Coot
Bobwhite Quail	Raptors
Canada Goose	Ring-necked Pheasant
Chickadees, Nuthatches, Titmouse and Brown Creeper	Ruby-throated Hummingbird
Chimney Swift, Purple Martin and Swallows	Ruffed Grouse
Chipmunk	Shrews
Common Nighthawk and Whip-Poor-Will	Snowshoe Hare
Cottontail Rabbit	Sparrows and Towhee
Coyote	Squirrels
Crows and Ravens	Striped Skunk
Diving Ducks	Tanagers
Doves	Thrushes
Eagles and Ospreys	Vireos
Elk	Vultures
Finches and House Sparrow	Weasels
Fisher	White-tailed Deer
Flycatchers	Wild Turkey
Foxes (Red & Gray)	Woodchuck
Gray Catbird, Northern Mockingbird and Brown Thrasher	Woodcock
Hérons	Wood Duck
Kingfisher	Woodpecker
Mallard	Wood Warblers
Mice and Voles	Wrens
Minks & Muskrats	
Northern Cardinal, Grosbeaks, Indigo Bunting and Dickcissel	

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Wildlife Note — 28

White-Tailed Deer

by Chuck Fergus



The white-tailed deer, *Odocoileus virginianus*, was so named because the underside of its tail is covered with white hair, and when it runs it often holds its tail erect so that the white undersurface is visible. Whitetails belong to the Cervidae family, which in North America includes elk, moose, caribou and mule deer. Cervids are split-hoofed mammals with no incisor teeth in the front of the upper jaw. They are classed as ruminant animals, meaning they have a four-chambered stomach and frequently chew a “cud.” Adult male whitetails grow and shed a set of antlers each year. On rare occasions, adult females also grow antlers.

Scientists have identified 30 subspecies of whitetails in Central and North America. Whitetails occur from southern Canada south through the United States and Mexico to Panama, but they are absent from most of Canada, Nevada and Utah. They occur commonly throughout Pennsylvania.

The largest of the subspecies is the northern woodland whitetail, and the smallest is the endangered Florida Key deer. The subspecies throughout most of Pennsylvania is the northern woodland whitetail.

In Pennsylvania the average adult buck weighs about 140 pounds live weight and stands 32 to 34 inches at the shoulder. He is about 70 inches long from the tip of his nose to the base of his tail. His tail vertebrae add only

about 11 inches, but the long hair makes it far more conspicuous. Does tend to average less in weight and body length than males of the same age from the same area.

Deer weights vary considerably, depending upon age, sex, diet and the time of year. For example, breeding-age bucks may weigh 25 to 30 percent more at the

onset of the breeding season than they do at its conclusion. Hence, a 140-pound buck in December might have weighed 180 pounds in September.

Hair color is alike in both sexes. In adults, the belly, throat, areas around the eyes, insides of the ears and the underside of the tail are white all year long. During summer, the upper parts of the body are reddish brown, and in winter they are grayish brown.

Summer hairs are short, thin, straight and wiry. Winter hairs are long, thick, hollow and slightly crinkled. Winter hairs afford the deer excellent protection against the cold. Summer coats are shed in August and September, winter coats in May and June.

Melanistic and albino deer occur but they are rare. Partial albinos, sometimes called “piebalds” or “calico” deer, occur more frequently.

Fawns are born with white spots in the upper coat. When a fawn is lying on the ground or in dry leaves this coat looks like the sun hitting the ground after it passes through the treetops. This provides excellent camouflage for the fawns. Their summer coats are molted about the same time as the fall molt in adults, and fawns take on the same coat colors as adults in the fall.

Whitetails have scent-producing glands: two tarsals, one inside each hind leg at the hock joint; two metatarsals, one on the outside of each hind leg between the hock and the foot; four interdigitals, one between the toes of each foot; and two preorbitals, one below inside corners of each eye. The tarsals and metatarsals release scents conveying excitement or fear, while the interdigitals produce odors which let deer trail each other by smell. The preorbitals are used to personalize the prominent overhanging branch at “scrapes” — thrown-up dirt patterns — used to attract does during the rut.

Deer can run at 40 miles per hour for short bursts and maintain speeds of 25 miles per hour for longer periods.



They are also good jumpers capable of clearing obstacles up to nine feet high or 25 feet wide. The air-filled hairs of their coats enable them to swim easily.

Although whitetails are color-blind and sometimes have a hard time identifying stationary objects, they are easily alerted by movement. Their keen senses of smell and hearing also help them detect danger.

Usually deer are silent, but they can bleat, grunt, whine, and when alarmed or suspicious, make loud "whiew" sounds by forcefully blowing air through their nostrils. Does whine to call their fawns and fawns bleat to call their mothers.

Although antler growth is evident on male fawns, the button-like protrusions are not prominent. A buck's first set of antlers begins to grow when it's about 10 months old. Each year after the buck reaches this age, it will grow and shed a new set of antlers. Typical antlers curve upward and outward to point forward, and consist of two main beams with individual tines growing upward from them.

If the yearling buck comes from an area with poor food conditions, his first set of antlers may be only "spikes" — antlers consisting of single main beams only. Spikes are more common in yearling deer than older ones because antler growth starts at a time when the young buck's body is still growing rapidly. But because antler development is tied in closely with the animal's nutritional status, older bucks might also carry spikes if they come from an area with poor food conditions. More of the nutrients in the young buck's body are going for body growth than in older bucks, hence, less are available for antler development. Fifty percent or more of the yearling bucks from poor deer range in Pennsylvania may produce only spikes, compared to 10 percent or less from good deer range.

Antlers generally begin to grow in March or April. Growing antlers are covered by a skin called "velvet." This velvet is covered with soft hairs and contains blood vessels which supply nutrients to the growing antlers. The solid bone-like substance which makes up the polished antler is secreted by cells on the inside of the velvet. By August or early September antler growth ceases and the velvet is shed or rubbed off by the buck as he rubs saplings, shrubs or rocks with his antlers. Polished antlers are carried throughout most of the breeding season, which can last into late February. The antlers are

shed at the end of this period, and a new set begins to grow in March or April.



While antlers grow they're soft and subject to injury. Bent and twisted tines and main beams are a result of injury to the antler while it was growing. Broken antlers occur after the antler has stopped growing and is hard. The small cavities sometimes seen in polished antlers are a result of botfly larvae damage during the growing period.

The antler cycle is influenced by secretions from the pituitary gland. Changes in length of daylight periods and, to a lesser degree, temperature influence the hormone secretions from this gland. Hormones are believed to be a factor in the initiation of new antler growth. Increases in the amount of testosterone in the blood of whitetail bucks in late August and early September cause blood flow to the antlers to stop. The velvet dies and is shed or rubbed off. Throughout the breeding season, testosterone levels continue to increase until they peak in November, usually coinciding with the height of breeding. After that, testosterone abates, apparently triggering antler shedding.

Shedding usually occurs earlier in northern states than southern ones. Spike bucks tend to retain their velvet longer and shed their antlers sooner than bucks with branched antlers. The roles of age and nutrition in the length of antler retention are not fully understood at present.

Social Organization

The social organization of the whitetail is largely matriarchal. Although large numbers of deer are sometimes seen together in feeding areas or wintering areas, these associations are usually temporary and do not reflect the same strong ties as family associations between related does. The most common social group is an adult doe, her fawns and her yearling female offspring. Sometimes three or four generations of related does are present in a family group. When fawning season rolls around in late May, adult does leave the family group and remain alone to bear and rear their fawns. Once a pregnant doe leaves the family circle to bear her fawns, her yearling offspring are left on their own for the summer.

Siblings tend to remain together throughout most of summer. Sibling groups with yearling bucks separate in September as the rut approaches. Yearling bucks tend to disperse from the mother's home range at this time. Yearling does remain in the mother's home range and generally rejoin their mother and her new fawns between September and October.

During the breeding season adult and yearling bucks tend to stay alone except when in pursuit of a female approaching estrus. After the breeding season, in late January, yearling and adult bucks form loose associations of small groups, usually two to four animals, which remain together throughout most of the winter and summer months. These groups break up around September when the rut starts.

Reproduction

The mating season of white-tailed deer begins as early as September and can last into late January. Breeding

activity reaches its peak in early November, and most adult females have been bred by the end of December. Some females are capable of reproducing at seven or eight months of age and give birth at 14 or 15 months of age. Most of these animals breed a month or two later than older does, and they usually produce a single fawn.

The age and health of a doe influence her reproductive capacity. Females from the best range produce more fawns than those from poor range. Adult females (2.5 years and older) usually produce twins, and triplets are not uncommon. There is a tendency for young females to produce a larger percentage of male offspring than older does.

Food Habits

Whitetails eat a wide variety of herbaceous and woody plants. In a Pennsylvania study where biologists examined and measured the food contained in the rumens of vehicle-killed deer, about 100 different plant species were identified. More than half were tree, shrub or vine species, the remainder, herbaceous plants. A good number of ingested plants could not be identified.

Whitetail food preferences are largely dependent on plant species occurring in an area and the time of year. Green leaves, herbaceous plants and new growth on woody plants are eaten in the spring and summer. In late summer, fall and early winter, both hard and soft fruits such as apples, pears and acorns are a major component of their diet. In winter, evergreen leaves, hard browse and dry leaves are eaten. Good supplies of a variety of natural foods at all times of the year are essential if an area is to carry a healthy deer population.

Habitat

A seedling-sapling forest satisfies two deer needs: (1) concealment, and (2) food in the form of buds, stems and leaves of shrubs and young trees. Seedling-sapling stands are created most frequently by timber harvesting. Clearcutting, or even-aged timber management, means cutting most trees larger than saplings, but leaving an area of land looking "clear." This cutting technique should be restricted to areas where sufficient regeneration is present to guarantee a sustainable forest. In the timber cut, snags, den trees, mast trees and rare tree species should be left behind to assure a good habitat diversity for an abundance of wildlife.

Newly cut treetops provide an immediate source of browse in winter months when snow cover makes other sources of food unavailable. Therefore, when possible, the actual cutting operations should be carried out when the trees are dormant. However, the greatest benefit of clearcutting to deer lies in the often abundant new growth vegetation and succulent sprouts and seedlings that flourish in the sunlight following the cutting. Once established, this new thick growth also provides concealment for deer, not only in the early years following the cutting, but for a longer period, after much of the browse has grown out of their reach.

While most deer habitat management should revolve around a forest cutting program, including the establishment of herbaceous openings, a conifer tree planting pro-

gram to shelter deer in severe winter weather is sometimes necessary where suitable cover of that type is absent. The value of these plantations to deer is low during most of the year but high during winter. As with clearcutting, conifer plantations should be kept small and scattered. Large plantations are unnecessary. Small clumps of only 30 to 60 trees will suffice. Individual trees within the plantation can be spaced as far apart as eight to ten feet. Preferably, these clump plantings should be located in lowlands or on south-facing slopes.

Management

Deer are a valuable natural resource, but they must be closely managed or they'll quickly overpopulate the range they inhabit. When overpopulation occurs, deer strip their habitat of its life-supporting qualities, not just for deer, but for many woodland wildlife species. Crop and other property damage problems also increase, as well as deer-vehicle collisions.

Pole timber and over-browsed woodland cannot support large densities of deer. Without adequate food sources and cover, deer populations are stressed. Deer must work harder for daily nourishment and often have not built up the energy reserves they need to make it through winter. Young deer, because they require food for both growth and energy reserves, are most susceptible to winter starvation and exposure. They simply don't have the muscle to push away older, more dominant deer at feeding locations.

Under-nourished deer are more prone to succumb to exposure and disease. In addition, unhealthy deer typically have smaller body size, lower reproductive rates and smaller antlers. So the key to managing deer is keeping their populations at healthy levels. This essentially entails ensuring they don't exceed their range's ability to support them. We use hunting to adjust deer populations.

Population control can be accomplished only through a rationed harvest of female deer. The Game Commission issues permits entitling hunters to take antlerless deer in particular management units, areas where the agency continually collects deer population data. Deer populations and density goals based upon habitat, along with hunter success rates, are used to gauge how many hunting permits should be issued.

Public support of our management program is essential to maintaining the deer population as a public asset to be enjoyed by future generations of Pennsylvanians and visitors to Pennsylvania.



Wildlife Notes

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Wildlife Note — 17
LDR0103

Wild Turkey

by Chuck Fergus

The wild turkey is a shy, permanent resident of Pennsylvania's woods and mountains. Infiltrating a flock of these big birds is no easy feat, and when the hunter or naturalist is finally discovered, he's treated to a spectacle as the flock breaks up. Turkeys flap upward on loud wings. Some run full tilt, heads extended on serpentine necks. Others sneak along through the understory. Eventually, quiet returns to the woods. And, with time the first tentative calls of regrouping birds break the silence

Turkeys have long been important to man in North America. Indians hunted them for food, and some even

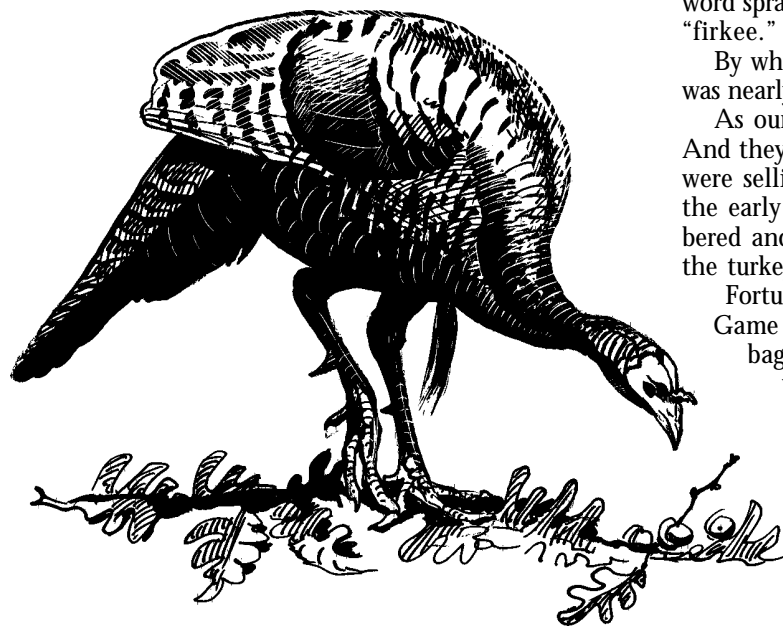
domesticated the big birds. Later, the wild turkey became a steady food source for white settlers. It earned a symbolic role as the main course of the Thanksgiving meal, which epitomized the successful harvest. Benjamin Franklin so admired the big bronze bird that he wanted it for our national emblem. Comparing it to the bald eagle, he said: "The turkey is a much more respectable bird, and withal a true original Native of America."

Several theories explain how the bird got its name. Early naturalists may have confused it with a species of Old World guinea fowl found in Turkey. Or the word may describe one of the bird's calls, which sounds a bit like "turk, turk, turk." Still a third explanation is that the word sprang from an American Indian name for the bird, "firkee."

By whatever name, the fact remains that this big bird was nearly exterminated by the ax, the plow and the gun.

As our nation grew, settlers cleared forests for farms. And they shot turkeys for food. By 1800, market hunters were selling the birds for as little as six cents each. By the early 1900s — when eastern forests had been lumbered and periodic fires hampered their regeneration — the turkey was in trouble.

Fortunately, here in Pennsylvania, the newly-formed Game Commission stepped in. Through seasons and bag limits, the agency succeeded in safeguarding what remained of the state's once-thriving population. It was found in the mountains of the state's southcentral counties. Over time, the agency experimented with ways to return turkeys to the rest of Penn's Woods. A turkey farm was tried. So was placing hen turkeys in holding pens for wild gobblers to breed with. But neither technique fared well. What turkeys needed was habitat improve-



ments. In the 1950s, as the state's forests began to mature, turkeys began to expand their range. Expansion was furthered through a Game Commission wild turkey trap-and-transfer program that would become a model for every state interested in turkey restoration. Today, turkeys are found in every county, and this wily bird has developed quite a following among hunters.

Biology

North American turkeys — including the domesticated bird — belong to the single and highly variable species *Meleagris gallopavo*. Taxonomists recognize at least five subspecies; the variety found in Pennsylvania is known as the Eastern wild turkey. Turkeys are gallinaeous — “chicken-like” — birds (order Galliformes), related to grouse, quail, pheasants and chickens.

Adult males, also called “gobblers” or “toms,” stand 2½ to 3 feet tall and 3 to 4 feet long. Females (hens) are shorter by about a third and weigh about half as much. Gobblers weigh up to 25 pounds, averaging 16. Adult hens weigh 9 to 10 pounds, and six-month-old birds, 6 to 13 pounds.

The wild turkey looks much like the domesticated subspecies, except the wild bird is slimmer, has a smaller head, a longer neck, longer, rangier legs, and smaller fleshy head and neck adornments. Tail feathers and tail coverts are tipped chestnut brown on wild birds, white on domesticated ones.

Plumage is an overall rich brown. In shadows, turkeys appear black; in bright sunlight, their feathers gleam with copper, blue, green and mahogany highlights. A hen's plumage is duller and not quite as iridescent, and her breast feathers end in a brown or buff band, while those of a gobbler are tipped with black.

Gobblers have spurs — sharp, bony spikes on the backs of their legs that are used in fighting — and rough, black “beards,” growths of rudimentary, hair-like feathers called mesofiloplumes, which protrude from their breasts. These beards grow quickly for the first four or five years, then more slowly, until they're about 12 inches long. The ends may break off, though, so beard length isn't a reliable indicator of age. Usually, hens have neither spurs nor beards.

A gobbler's head is practically bare, while that of a hen is covered with hair and fine feathers. A fleshy, pencil-like appendage called a caruncle, or snood, dangles from between the gobbler's eyes. Heads of both sexes are bluish-gray, and their necks may have a pinkish flush. During mating season, a gobbler's head and neck are more red; during courtship display, his snood may become long and swollen, and the color of his head and neck changes quickly from red to blue, purple and white.

Food: In spring, turkeys eat tender greens, shoots, tubers, left-over nuts and early insects. As the weather

warms up, they eat more insects, including grasshoppers, walking-sticks, beetles, weevils, dragonflies and larvae. They also consume spiders, harvestmen, ticks, millipedes, centipedes, snails and slugs. But even in summer, a majority of the diet (perhaps 90 percent) is vegetable. A wide variety of plant species are eaten, as well as a number of plant parts, including fruits, seeds, seedheads, tubers, roots, bulbs, stems, leaves, flowers and buds.

In fall, turkeys eat mast (beechnuts, acorns); fruits (dogwood, grape, cherry, gum, thornapple); and seeds (grasses and sedges, ash, corn, oats, weeds). During winter, they rely on seeds, nuts, and fruits left over from autumn, and on green plants, crustaceans and insect larvae found in and around spring seeps. Temperature of this water is above freezing, so the seeps remain open all winter, providing food for turkeys and other wildlife.

A turkey often scratches for its food, kicking forest duff and leaves behind. If the bird finds an acorn, it picks up the nut in its beak, straightens its neck, and swallows.

The nut is stored in the bird's crop, a flexible bag in which juices and body heat work to soften it. Then the nut passes into the gizzard, an enlarged, thick-walled section of the food canal which contains small stones and gravel called grit. Strong muscles use the grit to grind down the acorn.

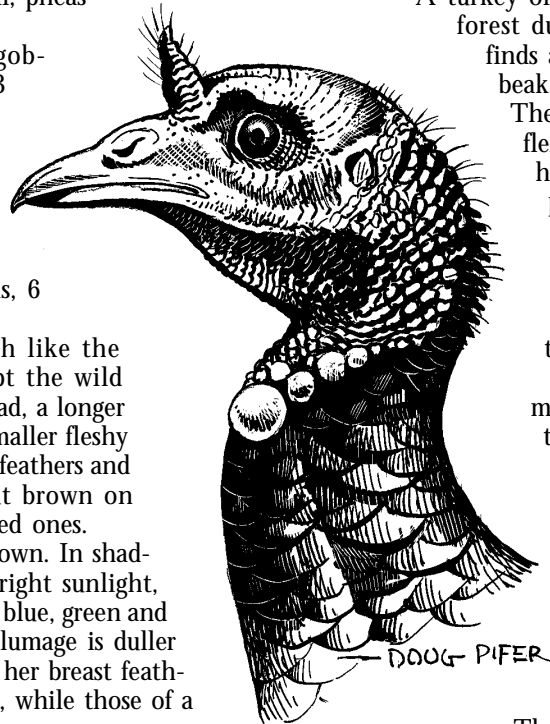
Turkeys may range up to several miles a day in search of food and water, sometimes establishing regular feeding areas if left undisturbed. In autumn, hunters “read” the food scratchings to determine when a flock passed by, what size the flock was, and which way the birds were headed.

Physical properties, behavior: Like most birds, turkeys have keen eyesight and hearing.

They hide cleverly, fly 40 to 55 mph, cover more than a mile while airborne, swim with ease — but they usually rely on their feet to escape danger. The strides of chased gobblers have been measured at four feet and their top speed estimated at 18 mph. Tracks vary somewhat by the age of the bird (a young tom, for example, might have a shorter print than an adult hen) but any track larger than 4¼ inches, from the back of the heel pad to the tip of middle toe, was probably made by a male.

Each evening, turkeys fly into trees to spend the night. A flock of up to 40 or more birds may roost in the same tree or in adjacent trees. They prefer the shelter of conifers during inclement weather. In early morning, the birds glide to the ground, call, and regroup for feeding.

Turkeys make a wide range of sounds. Best known is the male's gobble (described *ill-obble-obble-obble*), used in spring to attract females and proclaim territory. Other calls include yelps (*keouk, keouk, keouk*), made by both sexes; the cluck (*kut*), an assembly note; the whistle, or “kee-kee run” of a young bird (*kee, kee, kee*); and the



alarm note (*putt*). Gregarious birds, turkeys call when separated from the flock. By imitating such calls, hunters attract birds.

Reproduction: Toward the end of March, a male turkey changes physically. His fleshy crown swells and turns pale, his wattles redden and hang from his head, and he develops a thick, spongy breast layer containing oils and fats to help sustain him over breeding season. Toms gobble loudly in early morning and sometimes in late evening. Blowing a car horn, beating a tin pan, or making almost any loud noises may provoke lusty gobbles.

If hens are present, a gobbler will display by fanning his tail, erecting his feathers, and tucking his head back against his body. He will strut back and forth, hissing and dragging his wing tips on the ground. Rival males fight: each grasps the other's head or neck in his bill and tries to shove or pull his foe off balance. The first bird to let go or lose balance gets thrashed with wing and spur.

Year-old birds are sexually mature; hens often mate during their first spring, but young males usually can't compete with mature gobblers. A dominant male may collect a harem of 8 to 12 or even more hens. Males are polygamous: a gobbler mates with several hens and plays no part in nest site choice, brooding eggs or rearing young.

In late April, mated females slip away from the flock. They choose nesting spots in wooded or brushy areas, near water sources and usually close to forest clearings or old fields. Nest: a leaf-lined depression in the ground. It may be located under the curve of a fallen log, concealed by vegetation or fallen branches or at the base of a tree.

The gobbler's sperm is stored in the hen's oviduct, so that fertilized eggs may be laid up to four weeks after mating. One mating is usually sufficient to fertilize an entire clutch. A hen lays an egg nearly every day until her nest contains 8 to 15 (average, 12; smaller clutches by younger birds), but won't begin incubating constantly until after all eggs are laid.

Eggs are oval and pointed markedly at one end. The smooth, dull shells are colored pale buff and are evenly marked with reddish-brown spots or fine dots. Foxes, bobcats and great horned owls prey on nesting hens; eggs are eaten by the aforementioned predators plus mink, raccoons, opossums, black snakes, skunks, crows and red squirrels.

Incubation takes about 28 days. After young hatch, the hen broods them until they're dry and then, if the weather is mild, leads them away from the nest.

Poults: Young turkeys are called poults. They're covered with a fine, brownish fuzz and even at hatching have a wild turkey's distinctive long neck and legs. Easy game for predators, their main defense is to hide. They scatter and freeze at the hen's warning call, remaining motionless until she sounds the all-clear. A hen may feign injury to lure intruders away from her young.

Poults need high-protein food, and the hen soon leads them to open areas where insects abound. Poults eat leafhoppers, crickets, other insects and larvae, tender greens and fruits. The hen broods them nightly for at least two weeks, until their wings develop and they can roost in trees. When poults are about three weeks old, several family groups may merge to form a flock of hens and poults.

Six-week-old poults are fairly strong fliers, and by au-

turn they're practically self-sufficient. Birds of the year can be identified by their middle tail feathers, which are longer than the others. In adults, the edge of the fanned tail forms an unbroken curved line.

In autumn, flocks often contain several old hens and their young, and occasionally hens that have not raised broods, for a total of 40 or more birds. Old toms usually remain apart, in pairs or trios. During early winter, family groups disperse and form new flocks by sex and age: hens, young toms and old toms.

Although susceptible to diseases turkeys are hardy animals. Disease outbreaks have been verified in the past, but none has had substantial population impacts over large areas. Periodically, a harsh winter may lead to starvation, especially if there is deep, powdery snow which makes it difficult for birds to become airborne.

Population

In 1900, few turkeys were left in the eastern United States, largely because widespread logging had destroyed their woodland habitat. An estimated 5,000 birds remained in Pennsylvania, a far cry from the large, healthy population that had existed here (mainly in southcentral Pennsylvania's oak and American chestnut forests) a century earlier.

Restoration of the species involved several steps. First, refuges were established and new game laws strictly enforced to protect remaining local populations. Half-wild turkeys were bred on the Game Commission's wild turkey farm, beginning in 1930. These birds proved to be nearly useless. As cut-over forests began to regrow, existing wild flocks began to move into new areas on their own. In addition, wild birds were trapped in areas where they were abundant and transferred to suitable, but unoccupied, habitat to speed up the dispersal that was naturally occurring. The superiority of this approach over game farm turkey releases has been obvious. Today turkeys are found throughout the state and are abundant in areas where, in the past, continual releases of game farm turkeys failed to establish even limited self-sustaining populations.

The Game Commission also works to improve turkey habitat, especially brood and winter range, which are necessary for population expansion to occur. Penn's Woods is currently home to about 250,000 wild turkeys.

What are a turkey's chances of survival, from egg to adult? The following statistics are from *The Wild Turkey - Biology and Management*, edited by James G. Dickson and published in 1992 by Stackpole Books: (a) nesting success of the turkey is 31 to 45 percent, about normal for a ground-nesting species; (b) 53 to 76 percent of poults perish, mostly within two weeks of hatching; (c) life expectancy of a turkey surviving its first two weeks of life is still less than 1½ years, although a few have been known to survive more than 10 years in the wild; (d) annual turkey survival generally ranges from 54 to 62 percent; (e) predation is generally the most common cause of wild turkey mortality; and (f) hunting-related turkey mortality is highly variable, depending largely on varying hunting season regulations, but can range from less than five percent to more than 50 percent of all losses.

Habitat

Turkeys have shown more tolerance for fragmented habitat (woodlots) and human disturbance than previously believed, but they still depend on forested habitats and do best with limited human activity. Habitat diversity — varying habitat types and differing ages — is the key to good turkey habitat. Turkeys seem to do best with a mix of forested, actively farmed and reverting farmland habitat types.

A turkey flock uses an extensive area — several thousand acres — during a year to meet its needs, so small landowners shouldn't expect to have resident flocks. However, anyone with forested land can do something to benefit turkeys, especially if neighboring landowners will cooperate.

Trees such as oaks, beech, cherries, etc., are most beneficial to turkeys when producing the maximum mast; this occurs when trees are 50 to 100 years old. Landowners can manage their woodlands for saw-timber by conventional even- or uneven-age silvicultural approaches and "pushing" young hardwood stands to maturity by culling out less-vigorous and non-mast-producing trees. Some woodland cuttings — which aren't economical in terms of timber management — can be made to allow more sunlight to reach grape, dogwood, greenbrier, hawthorn, viburnum and other food-producing understory species. Planting shrubs such as Japanese barberry, autumn olive, Asiatic crabapple and Washington hawthorne will provide abundant and persistent winter foods.

Forest clearings are especially used by hens and poults. Here, sunlight penetrates the tree canopy and allows

grasses and forbs to spring up; increased plant life gives rise to increased insect life, and insects form a key part of a young turkey's diet. Thus, forest openings resulting from cleared timberlands, old logging roads and logging camp sites, power line rights-of-way and old beaver meadows should be preserved, or planted with a grass-legume mixture if needed. Spring seeps are also important, as they provide insect and vegetable food over winter.

Free water (streams, lakes, ponds, springs, seeps, rain-water in shallow depressions) has never been demonstrated to be lacking for wild turkeys in the eastern United States. Artificial feeding? Turkeys don't generally need it, especially if they live in good habitat. Such feeding may actually pose a hazard by unnaturally concentrating a local population, thus increasing the danger of poaching and disease spread, and giving predators an unnatural advantage.

Every day, expanding towns and new roads cut into our state's limited amount of wildlife habitat. Second home development — booming in the northcentral's prime turkey range — is especially threatening. We cannot expect to continue taking land at this rate and still have animals like turkeys and bears which don't coexist well with man. Snowmobiles, trailbikes and four-wheel-drives disturb turkeys, even though the drivers of these vehicles may never see a single bird; if such intrusion goes on too long, it can cause flocks to leave a given area for good.

Pennsylvanians can be proud of the wild turkey's restoration to this state. With enough concern for meeting *all* the birds' needs, we can enjoy them well into the future.

Wildlife Notes are available from the
Pennsylvania Game Commission
Bureau of Information and Education
Dept. MS, 2001 Elmerton Avenue
Harrisburg, PA 17110-9797
www.pgc.state.pa.us

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Pennsylvania Game Commission

Wildlife Notes

Envirothon students will be able to identify the animals described in the Wildlife Notes listed below.

- | | |
|--|--|
| 1. Bats | 27. Mink & Muskrats |
| 2. Beaver | 28. Northern Cardinal, Grosbeaks, Indigo Bunting, and Dickcissel |
| 3. Black Bear | 29. Opossum |
| 4. Blackbirds, Orioles, Cowbird, and Starling | 30. Owls |
| 5. Blue Jay | 31. Pheasants |
| 6. Bobcat | 32. Porcupine |
| 7. Canada Goose | 33. Puddle Ducks |
| 8. Chickadees, Nuthatches, Titmouse, and Brown Creeper | 34. Raccoon |
| 9. Chimney Swift, Purple Martin, and Swallows | 35. Raptors |
| 10. Common Nighthawk and Whip-Poor-Will | 36. River Otter |
| 11. Cottontail Rabbit | 37. Ruffed Grouse |
| 12. Crows and Ravens | 38. Shrews |
| 13. Diving Ducks | 39. Sparrows and Towhees |
| 14. Dove | 40. Snow Goose |
| 15. Eagles and Osprey | 41. Squirrels |
| 16. Eastern Coyote | 42. Striped Skunk |
| 17. Elk | 43. Tanager |
| 18. Finches and House Sparrow | 44. Tundra Swan |
| 19. Fisher | 45. Vultures |
| 20. Flycatchers | 46. Weasels |
| 21. Foxes (Red and Gray) | 47. White-tailed Deer |
| 22. Gray Catbird, Northern Mockingbird, and Brown Thrasher | 48. Wild Turkey |
| 23. Heron Family | 49. Wood Duck |
| 24. Kingfisher | 50. Wood Warbler |
| 25. Mallard Duck | 51. Woodchucks |
| 26. Mice and Voles | 52. Woodcock |
| | 53. Woodpeckers |
| | 54. Wrens |

WHITE-NOSE SYNDROME SURFACES IN PENNSYLVANIA

By Joe Kosack

Wildlife Conservation Education Specialist

Pennsylvania Game Commission

SHINDLE, Mifflin County – Aware since 2008 that White-Nose Syndrome appeared to be making its way to the Keystone State, the Pennsylvania Game Commission now has evidence that the deadly bat disorder is likely present in a mine near this small community in the state's heartland. Where else this may be occurring and the consequence to bats –a fragile guild of wildlife species – remains an unfolding story.

In late December, Dr. DeeAnn Reeder, a biologist with Bucknell University, and Greg Turner, a biologist with the Game Commission's Wildlife Diversity Section, found bats in an old Mifflin County iron mine that exhibited some of the signs of White-Nose Syndrome (WNS), during field investigations into bat hibernation patterns that included weekly monitoring for the disorder's presence in several Pennsylvania hibernacula. During this work, which had been ongoing for weeks, dozens of bats suddenly had a fungus appear around their muzzles and on wing membranes, while many more displayed other symptoms associated with this disorder. Several bats were submitted to the National Wildlife Health Center in Madison, Wisconsin, which now is reporting that the bats have preliminarily tested positive for the cold-loving fungi found on many bats with WNS.

"Our agency, with assistance from the U.S. Fish and Wildlife Service and other management partners, will work diligently and methodically to measure the extent of the problem in Pennsylvania and monitor the disorder's progression," said Carl G. Roe, Game Commission executive director. "This find is a direct result of the Game Commission's ongoing initiative to proactively monitor for WNS.

"To date, no dead bats have been found in Pennsylvania. That's a plus, but it comes with no promise of what will or won't follow. In New York and New England, the disorder seems to arouse bats from hibernation prematurely. Once they depart from caves and mines, they quickly sap their energy reserves and die on the landscape. Mortality in some colonies has exceeded 90 percent, ensuring that any local recovery will be quite lengthy given the low reproductive rate of bats. Little brown and the federally-endangered Indiana bats produce only one young per year."

Currently, researchers still are unsure exactly how bats contract WNS and how it initially and, ultimately, affects a bat's body. They cannot confirm whether the fungus appearing on some bats is a cause or a symptom of the disorder. What is clear is that the geographic area where WNS has been documented is expanding. It was first found in bat colonies in New York in 2006, and subsequently in populations in Connecticut, Massachusetts and Vermont in 2007. Now bats in Pennsylvania and New Jersey appear to be affected.

"We do know that the visible fungus appears on some – but not all – bats afflicted with WNS, and that a significant percentage of bats in affected hibernacula move closer to the entrance," explained Turner. "The bats eventually leave their hibernacula – often in daylight, which is unnatural. Most of those bats likely die on the landscape, but some may return to the cave or mine they left. Researchers cannot determine what bats are searching for, or if they're hunting for anything. Most bats found dead on the landscape have depleted their fat reserves."

About the only thing certain about WNS is that its ambiguity continues to baffle the cadre of researchers who are working long hours to positively identify what it is, and if there is anything wildlife managers can do to disable it. WNS does appear to be spreading bat-to-bat, but it's unknown whether it's passed in summer roosts, or hibernacula, or both. It also is unknown yet whether the



PGC Photo/Joe Kosack

In Deep – Game Commission Biologist Greg Turner and Dr. DeeAnn Reeder of Bucknell University monitor the signals of transmitters affixed to hibernating bats in Shindle Iron Mine. [Get Image](#)



PGC Photo/Joe Kosack

Troubled Future – A few of these hibernating little brown bats in Shindle Iron Mine exhibit what is



Wildlife Note — 38
LDR0603

Wood Duck

by Chuck Fergus

The wood duck is our most brilliantly colored duck. Its scientific name, *Aix sponsa*, can be loosely translated as “a waterfowl in wedding dress.” This shy, retiring bird inhabits ponds and sluggish streams surrounded by woodlands. Nicknames include Carolina duck, squealer, summer duck and woodie. Most authorities place the species with the puddle or dabbling ducks, a group distinguished by its habit of feeding on and near the surface of shallow waters, rather than diving for food.

Wood ducks range from the Mississippi River east to the Atlantic coast, and from the Great Lakes Region south to the Gulf of Mexico. Most of them winter from the Carolinas south to the Gulf and west to eastern Texas. A small population of wood ducks also inhabits the Pacific Northwest. In Pennsylvania, woodies are common migrants in March and April; summer breeding residents; common migrants in September, October and early November; and occasional winter residents in the south-east and southwest corners of the state.

Biology

An adult wood duck is 18 to 20 inches long, has a 24-inch wingspan, and weighs 1½ pounds. The male is called a drake, the female a hen. The drake's coloration is nothing short of exotic. His head is iridescent green, shading into blue and purple, with a slicked-back crest of feathers and a white chin-bib. His eyes are bright red, his bill reddish-orange, his legs yellow. His chest, a rich chestnut, is separated from his golden-yellow sides by vertical bars of white and black. The hen's plumage is drab, a combination of gray, white and brown. She has a small head crest and a circle of white surrounding each eye.

Wood ducks do not quack. The hen, more vocal and louder than her mate, squeals a shrill warning call, *hoo-eeek hoo-eeek*. The drake whistles an ascend-

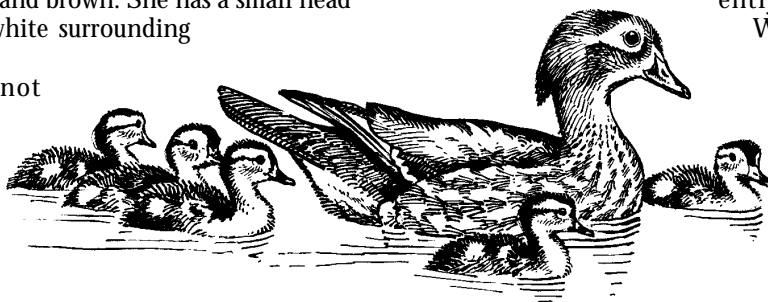
ing, finch-like *twee twee*. Woodies are excellent swimmers and fast, agile fliers. Above open terrain they can wing along at up to 50 mph; in woodlands they twist and turn between the trees, moving their heads almost constantly in flight.

The wood duck feeds along shores of woodland streams and ponds. A dabbling, it tips its head into shallow water and probes the bottom for vegetative parts and seeds of pondweeds, wild rice and water lilies. It also eats grapes, berries, and nuts — acorns, hickory nuts and beech-nuts — which are swallowed whole and crushed, inside the gizzard, into digestible bits. Insects and spiders comprise about 10 percent of the adult's diet, while the duckling eats a larger percentage of these high-protein animal foods. In winter, wood ducks may turn to waste corn if natural foods are scarce.

Breeding occurs in late March and April, extending into May in the north. Most pairs form on the wintering range, following an intense courtship. The male preens behind his wings, spreading them to show off their iridescent sheen, he tucks in his chin, erects his crest, and fans his tail. He swims at the hen then circles her.

When the birds migrate north, the hen homes in on last year's nest tree or, if she is a yearling, on the same general locale in which she was hatched. The male sets up no actual territorial boundaries, but will defend his mate from the attentions of other males. Several breeding pairs may share the same pond. Nesting concentrations are largely determined by the availability of nest sites. The mated hen seeks out a cavity in a tree; the male follows her on these search flights, but the hen apparently picks the exact spot.

Wood ducks prefer to nest in trees standing over water, but sometimes will settle for sites up to a mile away. They normally use natural cavities with entrances too small for raccoons to enter, often choosing excava-



tions made by pileated woodpeckers. They also nest readily in man-made boxes.

The hen lays 8 to 15 eggs (one per day) in the bottom of the cavity, on accumulated wood chips covered with down from her breast. The eggs are dull-white and unmarked. Incubation, by the female alone, starts with the last egg and takes about a month. Unlike most other male ducks, the drake woody stays with his mate well into her incubation. He has usually left the scene, though, by the time the eggs hatch.

All the eggs hatch on the same day. The hen usually keeps her brood in the nest overnight, and then in the morning she flies out and lands on the ground or water below, where she begins calling softly. The day-old ducklings leap out of the nest to join her. They tumble down perhaps 60 feet, sailing like cotton puffs and usually landing unharmed. The hen leads them to safety along a lake or a stream.

If a raccoon, snake or squirrel destroys her first clutch, the female may lay a second. A few hens raise two broods, but the vast majority raise only one.

Ducklings — and adults — are preyed upon by minks, otters, raccoons, hawks and owls. In Maryland, scientists found that half of the young were killed in their first month. The brood begins to break up after six weeks or so, and the young can fly when two months old.

After leaving his incubating mate, the drake woody joins other male wood ducks in the dense cover of a swamp or wooded pond. Here he molts into eclipse plumage: dull feathers resembling the drab plumage of a hen. During part of the annual summer molt, wood ducks — both drakes and, later, hens — lose their wing feathers and cannot fly. In late summer or early fall, a second molt begins, restoring the normal plumages.

Wood ducks migrate south for the winter. Some seek out common roosting and feeding sites, grouping in flocks of less than a hundred to several thousand. Pennsylvania band surveys show most of our home-grown woodies winter in the Carolinas, Georgia and Florida.

Population

In the early 1900s, the wood duck was nearing extinction. Many woodland ponds, the species' favorite habitat, had been drained. Widespread logging had removed the mature trees needed for nesting. And for years the woody had been hunted hard for its good-tasting flesh.

In 1913, wood duck hunting was banned for five years by the U.S. Department of Agriculture to spur a population recovery. That effort was followed by the ratification of the Migratory Bird Treaty Act between the United States and Canada, which established the framework needed to manage waterfowl on a broader scale than with

inconsistent state plans. The wood duck was also aided by Pennsylvania's beaver reintroduction program, which began in 1917, and the construction and placement of thousands of wood duck nest boxes by conservation organizations.

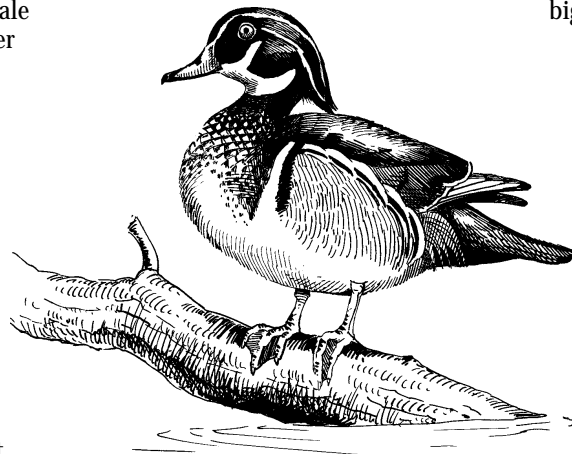
The wood duck population grew steadily. In 1941, hunting was again permitted. In 1976, waterfowl scientist Frank Bellrose reviewed many local studies and concluded that the adult population of wood ducks is about 1 million before each year's breeding. Others have estimated the annual post breeding population at 2½ to 3½ million.

Today the wood duck has reclaimed most of the Atlantic Flyway and a large part of the Mississippi drainage. The greatest concentration of woodies lies in Ontario.

Habitat

Wood ducks inhabit slow-moving creeks, woodland ponds, lakes, swamps, marshes and beaver ponds. They rest in thick growths of water lilies, smartweeds and other emergent plants; hens hide their ducklings in vegetation, under overhanging banks and among fallen, partly submerged trees.

Woodies nest in cavities of mature sycamore, maple, oak, basswood, elm and gum trees. Where big trees are scarce, they will use man-made nest houses. Artificial nests should be made predator-proof, as they attract raccoons, squirrels and other predators looking for a meal. Place nest boxes on poles over water; attach metal shields partway up the poles, and make sure the boxes' entrances are small enough to exclude raccoons. Studies in Pennsylvania show that hens and broods having to travel more than a mile from their nest box to brood-rearing wetlands experience the highest mortality. That's why it's a good idea to place nest boxes near suitable wetlands. Wood duck boxes also provide nesting space for American kestrels, common screech owls, mergansers, squirrels and occasionally, wrens and tree swallows. Plans for the boxes can be obtained by writing: Pennsylvania Game Commission, Dept. MS, 2001 Elmerton Avenue, Harrisburg, PA 17110-9797.



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Wildlife Note — 47
LDR0103

Wood Warblers

by Chuck Fergus

Like jewels strewn through the woods, our native warblers appear in early spring, the males arrayed in gleaming colors. Twenty-seven warbler species breed commonly in Pennsylvania, another three are rare breeders, and seven migrate through Penn's Woods for breeding grounds farther north. In central Pennsylvania the first species begin arriving in late March. The great mass of warblers passes through between May 10 and 15, and then the migration trickles off until it ends in late May — by which time the trees have leafed out, making it tough to spot canopy-dwelling species.

In southern Pennsylvania, look for the migration to begin and end a few days to a week earlier; in northern Pennsylvania, it's somewhat later. In August warblers start moving south again, with migration peaking in late September and ending in October, although stragglers may still come through into November. But by now most species have molted into cryptic shades of olive and brown: the "confusing fall warblers" of field guides.

The wood warblers (subfamily Parulinae) are found only in the New World. The group includes 110 species, with more than 50 found regularly in North America. Wood warblers are small lively birds that use a range of habitats. All of the North American species are migratory; almost certainly, most developed in the tropics and extended their ranges northward to exploit new breeding zones.

The name "warbler" is a misnomer, because few species possess warbling voices and many have thin, scratchy, unmusical songs. Males use two calls: a song to advertise territory, and a shorter call to attract a mate and to communicate with her.

Wood warblers breed in May and June, in woods and brushland, in areas that may be dry, moist or wet. They forage from ground level to the treetops and eat mainly small insects plus a few fruits; some warblers take flower nectar. When several species inhabit the same area, their feeding strategies are usually different enough that they don't compete directly with one another. Nesting habits vary



Yellow Warbler

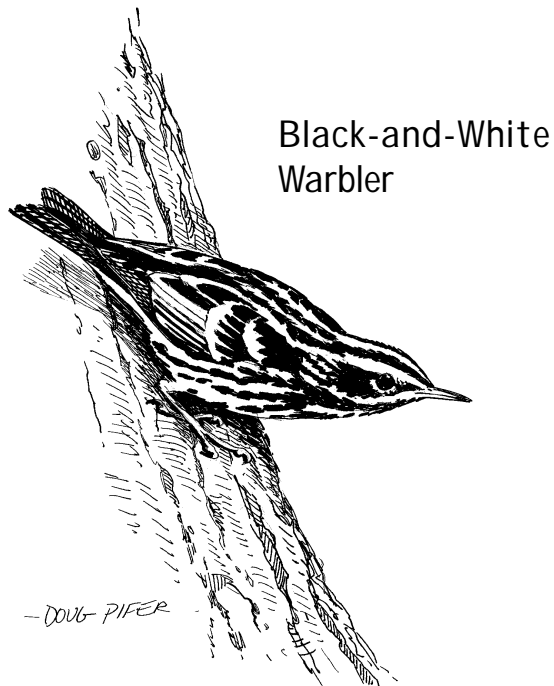
widely. The prothonotary warbler (*Protonotaria citrea*), a rare breeder in wetlands and bottomland forest in Pennsylvania, builds its nest in a tree cavity, often an old downy woodpecker hole. The Nashville warbler (*Vermivora ruficapilla*) is one of several species that nest on the ground. Some warblers nest exclusively in conifers; others use hardwood trees. The northern parula warbler (*Parula americana*) weaves its nest into hanging clumps of lichens, twigs or pine needles. Most species are monogamous. Generally the female builds the nest. The eggs, usually two to five per clutch, are whitish with dark spots. Typically the female does most or all of the incubating, and both parents feed the young.

We know less about warblers' habitat requirements and feeding activities on their winter range. Most species winter in Mexico, Central America and South America, where they forage in mixed flocks with several to many different species. Wood warblers tend to shun lowland rain forests, preferring foothill and mountain forests instead. A few hardy species (the yellow-rumped warbler, *Dendroica coronata*, is one) stay in North America all winter.

Warblers are small birds with limited fat reserves, and many perish from the rigors of migrating. A route followed by many species in spring requires a nonstop flight from the Yucatan Peninsula across the Gulf of Mexico to Louisiana, Mississippi, Alabama and Florida. If migrating birds encounter headwinds, many exhaust their strength, fall into the ocean and drown. Tremendous numbers of warblers and other night-migrating birds die when they fly into communications towers and tall buildings, particularly on cloudy

nights. Many individuals are killed by the smaller hawks and owls. Warblers have been documented to live for more than 10 years in the wild, but most die before reaching that age.

Some wood warbler populations are holding their own. Those of others, such as the cerulean warbler (*Dendroica cerulea*), which breeds in mature forests, have declined.



Black-and-White
Warbler

When northern woodlands are broken into smaller patches by logging or home development, warblers lose habitat. In fragmented woods, native birds and mammals, including blue jays, raccoons, foxes and squirrels, and feral house cats can prey more easily on warblers and their nests. Brown-headed cowbirds, which live in open areas, find greater access to warblers' nests: The female cowbirds surreptitiously lay eggs in the nests, and when the young cowbirds hatch, they are raised by the host adults, whose own smaller, slower-to-develop young usually don't survive.

Following is a closer look at eight common wood warblers of Pennsylvania.

Yellow Warbler (*Dendroica petechia*) — This showy all-yellow bird has a rufous-streaked breast. The male's song is a lively *weet weet weet tsee tsee*. The most widespread of all wood warblers, the species breeds statewide in Pennsylvania. Look for yellow warblers in low brush or shrubs, woods edges, orchards, parks and gardens; they're often found along streams and near swamps.

Caterpillars may make up two-thirds of the diet. Yellow warblers also snatch up mayflies, moths, mosquitoes, beetles, damselflies, treehoppers and other insects, plucking their prey from twigs and leaves, hovering to glean from the undersides of foliage, and making short flights. The nest is a neat open cup built of plant materials and lined with plant down or fur. Yellow warblers are often parasitized by cowbirds.

Foreign eggs cause some yellow warblers to desert their

nests or to build a new nest on top of the cowbird eggs. Yellow warblers arrive in Pennsylvania in April and May and head south again as early as July or August. They winter in Mexico, Central America and northern South America.

Chestnut-Sided Warbler (*Dendroica pensylvanica*) — In spring, both sexes sport a yellow crown, black face markings, and chestnut streaks on their sides. The song is similar to the yellow warbler's and has been rendered as *please please please ta meetcha*. This now common species increased its numbers after Pennsylvania's virgin forests were logged. Chestnut-sided warblers inhabit brush and briers, slashings of cut-over woods and reverting fields. They forage for insects by hopping from branch to branch, darting out now and then to intercept prey in midair. The nest is built in low, dense shrubs or blackberry tangles, and is woven out of strips of cedar or grapevine bark, weeds, grasses and roots, with a soft lining. Immature birds and adults in autumn wear a dull greenish plumage and look not at all like their bright spring selves. The winter range extends from Mexico through Panama.

Black-Throated Blue Warbler (*Dendroica caerulescens*) — One of the handsomest birds in the forest, the black-throated blue is aptly described by its name. (The slatey blue is set off by a white breast.) The species typically nests in deep woods, often in cove forests well stocked with hemlocks, with a bubbling stream nearby and plenty of gnats, moths, crane flies, caterpillars, and other insects. Males usually forage higher in the understory than do females; some black-throated blue warblers steal insects from spider webs. Males sing a buzzy, drawn-out *zur, zur, zree*. The nest is a bulky cup hidden in a rhododendron, laurel, or shrubby conifer. The species nests commonly in the mountains of northern Pennsylvania and north into Canada; it winters in the Bahamas and the Greater Antilles.



American
Redstart

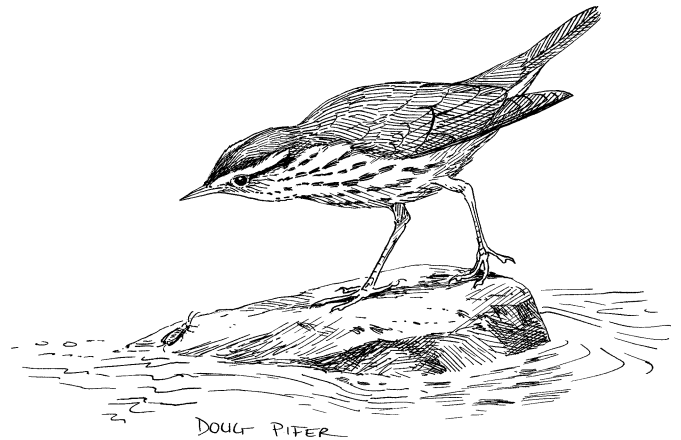
Black-and-White Warbler (*Mniotilta varia*) — This abundant bird acts more like a nuthatch or a creeper than a warbler, foraging methodically in tree bark, circling trunks and limbs of trees while looking for insects and their eggs. Both males and females have zebra stripes on their back and crown. Next to the Louisiana waterthrush, the black-and-white warbler is the earliest spring migrant; individuals are easily observed before the leaves push out. They often feed low in trees and usually nest on the ground in deciduous woods. The male sings a thin weeseee, weeseee, weeseee, etc., repeating the phrase at least seven times. The female builds a nest out of dry dead leaves and lines a central cup with grasses, strips of grapevine bark, rootlets and weed fibers. The nest is built at the base of a tree or tucked partway under a log, stump or rock. Cowbirds often heavily parasitize black-and-white warblers. Black-and-whites winter in Florida, the Gulf Coast states, the West Indies, and from Mexico south into South America.

American Redstart (*Setophaga ruticilla*) — Males are an eye-catching mix of black, orange and white; orange patches show on the wings and tail, which the bird often flashes open and shut. Redstarts flutter about in treetops, hovering among leaves, leaping up or darting out like a flycatcher to grab a passing insect: A redstart even has bristles framing its mouth to help it catch flying prey. The song is a series of high-pitched, indistinct tsee notes. American redstarts inhabit sapling woods, river groves, forest edges and treelined creek banks. A Wisconsin study found the species to be three times as common in woods of greater than 80 acres than in woodlots comprising less than 14 acres. In Pennsylvania the American redstart is rare in the highly agricultural southeast, common in the forested northcentral and northeast. Redstarts eat insects, spiders, seeds and berries. The female builds a cup-shaped nest in a tree fork 4 to 70 feet in the air. Some males breed with more than one female in their territories. Redstarts head south in August and September; they winter in the Gulf Coast states and from Mexico south to South America. The species is named after a European bird whose name means “red tail.”

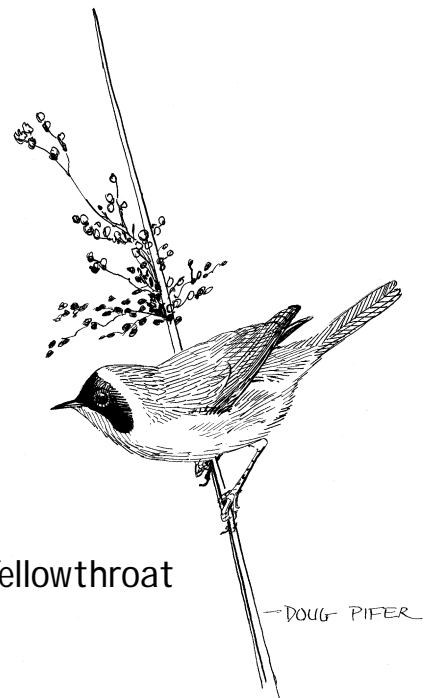
Ovenbird (*Seiurus aurocapillus*) — This bird gets its name from the covered dome-shaped nest it builds on the ground; early observers were reminded of a Dutch oven. An ovenbird looks like a little thrush, olive-brown above and with a dark-streaked (rather than a spotted) breast and an orange, black-rimmed stripe atop the head. Ovenbirds prefer dry mature deciduous woods, but they also inhabit other forest types including swamplands; they do best in extensive wooded tracts. Ovenbirds feed on the ground, taking beetles, ants, caterpillars, bugs, worms, spiders and snails. The song is an emphatic *Teacher! Teacher! Teacher!*, repeated about 10 times at increasing volume, three to four sessions per minute. The species nests statewide, although it's absent from heavily farmed and urbanized districts. The ornithologist Hal Harrison found cowbird eggs in six of seven Pennsylvania ovenbird nests that he monitored one summer, but research at Hawk Mountain Sanctuary found that few nests in deep forests contained those unwanted guests.

Ovenbirds arrive here in April and May, depart in September and October, and winter in Mexico, Central America, Florida and the Caribbean.

Louisiana Waterthrush



Louisiana Waterthrush (*Seiurus motacilla*) — In April, trout fishermen see this shy warbler walking on stones along the edges of streams, turning over wet leaves with its bill and flitting out over the water to catch prey. A Louisiana waterthrush looks like a thrush and acts like a sandpiper, teetering and dipping, elevated above slick rocks on its long legs, stabilized by large, long-toed feet. Waterthrushes eat bugs, beetles, adult and larval mayflies, dragonflies, crane fly larvae, ants, caterpillars and other insects, plus centipedes, small crustaceans and snails. They breed from April to June along rushing brooks, sluggish swamp streams, and moist hillsides, always in woods. Pairs build their nest in a hole in the stream bank, hidden by tree roots, weeds or grass. Louisiana waterthrushes nest throughout the East; they winter in streamside forests in Mexico, Central America, the Bahamas and the Greater Antilles.

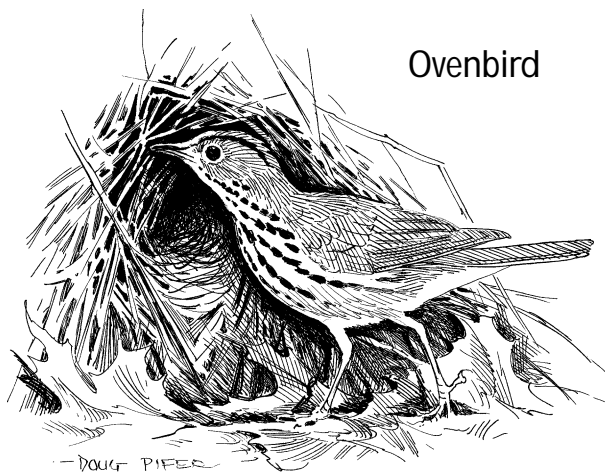


Common Yellowthroat

Common Yellowthroat (*Geothlypis trichas*) — *Witchity, witchity, witchity* sings this bird with the gray back, black mask, yellow throat and whitish belly. (Females lack the black mask.) In Pennsylvania, yellowthroats nest in cattail marshes, alder swamps, shrubby bogs, wet meadows, forest edges and openings, and old fields. They like thick briary cover and take advantage of small habitat patches: An ornithologist once found 17 nests in a half-acre swamp in Illinois. As the result of this broad habitat use, they are the most widespread of the warblers.

Nests are built on or near the ground, hidden in tussocks, weed stalks and shrubs; they're bulky, made of dry leaves and coarse grasses lined with finer plant matter. Yellowthroats eat insects (grasshoppers, dragonflies, mayflies, beetles, moths, ants, aphids and many others), spiders and seeds. They nest statewide across Pennsylvania and winter in the southern United States, Mexico and Central America. Illegal draining and filling of wetlands — even very small ones — harms yellowthroats and many other forms of wildlife. Yet the population of this spunky, active bird has increased in recent years in the Keystone State.

The other breeding warblers in Pennsylvania are the blue-winged, golden-winged, Nashville, northern parula, magnolia, yellow-rumped, black-throated green, Blackburnian, yellow-throated, pine, prairie, cerulean, worm-eating, Ken-



Ovenbird

tucky, mourning, hooded and Canada, and the northern waterthrush and yellow-breasted chat. Rare breeders include blackpoll, prothonotary and Swainson's warblers. Seven other warblers migrate through Pennsylvania: Tennessee, orange-crowned, Cape May, bay-breasted, palm, Connecticut and Wilson's.

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Wildlife Note — 6
LDR0103

Woodchuck

by Chuck Fergus



Known by many names — chuck, groundhog, whistle pig, marmot, monax and others — the woodchuck is a common Pennsylvania game animal. Members of the order Rodentia (rodents) and family Sciuridae (squirrels), woodchucks are closely related to tree and ground squirrels, chipmunks, prairie dogs and marmots. Chucks dig burrows; these holes aerate the soil and provide excellent escape hatches for many other animals, but they are dangerous to livestock and farm machinery. So the woodchuck is often thought of as a “valuable nuisance” — a contradiction in terms that illustrates well this inhabitant of field and fencerow.

Biology

The woodchuck, *Marmota monax*, is a mammal about 20 to 26 inches long, including a bristly, 6-inch tail. Weights of adult chucks vary from 5 to 10 pounds, with extremely large animals as heavy as 12 to 15 pounds. The weight of an individual fluctuates in a cyclic fashion throughout the year, with the animal at its heaviest by summer's end.

Woodchucks have yellowish-brown to blackish-brown fur. Belly fur is sparse and usually paler than the fur on the back. The pelt is coarse and has little or no commercial value. Light-colored hairs in the coat give some individuals a grizzled appearance. Albinism and melanism occur infrequently. A chuck's feet are dark brown or black, and its front incisor teeth are white. These two front teeth are broad and chisel-shaped like those of rabbits and squirrels and are used primarily to nip off vegetation. They identify the woodchuck as a rodent.

Woodchucks are found throughout Pennsylvania in open fields, meadows, pastures, fencerows and woodland edges and even deep in the woods. Adults rarely move more than a half mile within their home ranges, preferring to stick close to the safety of the burrow.

Chucks don't generally have to move far to find food, as they eat a wide variety of vegetation — including green grasses, weed shoots, clover, alfalfa, corn in the milk stage, dandelion greens, garden vegetables such as beans, peas and carrots and, in the fall, apples and pears. These feeding habits often get them in trouble with farmers and

gardeners. In the summer, woodchucks feed most actively during early morning and late evening.

A woodchuck has keen senses of sight, hearing and smell. Note where the animal's sensory organs are located on its skull: eyes, ears and nose are all near the top of the head, enabling a groundhog to check its surroundings simply by sticking its crown out of the burrow. When feeding, a chuck usually raises its head every 10 seconds or so to check for danger.

A muscular body, short powerful legs and sturdy claws make the chuck an excellent digger, and the critter spends much of its time underground. It piles excavated dirt at its burrow's main entrance and often sits on this mound to look about. The burrow descends at a sharp angle below the entry hole and then levels off into a narrower tunnel. Woodchucks often dig many side tunnels and two or three back entrances. These “drop holes” are inconspicuous — they aren't marked with dirt mounds — and chucks use them as lookouts or to get underground in a hurry when danger threatens. Burrows are usually located in well-drained, sloping areas and rarely get flooded. In digging, chucks use their strong forefeet to loosen the soil, then their hind feet to kick the earth behind them.

Even though a groundhog has short legs, it can run at a fairly fast clip for a short distance. An adult is a fierce fighter; dogs, coyotes and foxes are about the only enemies it has, although young chucks are preyed upon by owls and hawks. Woodchucks climb well, ascending and descending trees head first. They have good balance and frequently walk along wooden fence rails. They use their front paws much as people use their hands, to clutch stems of clover or hold apples while feeding.

Woodchucks can produce several sounds. They often let out a sharp whistle for an alarm call. When feeding, they may make a “chuck-chuck” sound, and when angry or cornered may chatter their teeth.

Woodchucks hibernate during winter. They eat heavily throughout summer and early fall to accumulate body fat and prepare to shelter in their burrows all winter. With the hard frosts of October, chucks begin denning up; few remain active past the first of November. A hibernating animal goes into a deep sleep, or a dormant state: its body temperature, heartbeat and other meta-

bolic processes fall off drastically as the animal lives over winter on its body fat. (A chuck's body temperature drops from over 90 F into the low 40s; heartbeat slows from more than 100 beats a minute to only four.)

In the spring, males emerge from hibernation before females, and during February and March fight aggressively. Fat left over from hibernation sustains chucks during mating season (late February to March), when succulent green foods are scarce. After a 28-day gestation period, females bear young in April and early May. Litters average 3 to 4 young; newborn chucks are blind, naked and helpless and remain in the underground nest until about a month old. By mid-June or early July, they are ready to leave the home burrows and establish their own territories.

This move is a perilous one for young woodchucks, and many are killed by vehicles or fall prey to dogs and foxes. The young often take up residence in abandoned dens. As fall approaches, they have to feed more actively than the heavier adults in order to accumulate enough fat to last them through the coming winter.

The potential lifespan of a woodchuck is estimated at eight or nine years. In a study conducted at the Penrose Research Laboratory, Philadelphia Zoo, observers found that captive woodchucks died of many causes, including cancer of the liver, ruptured aortas, heart attacks, and cerebral strokes resulting from hardening of the arteries. It's doubtful whether many chucks in the wild live to be eight years old. Enemies shorten this period, and the older an adult woodchuck gets the more easily it falls prey to predators.

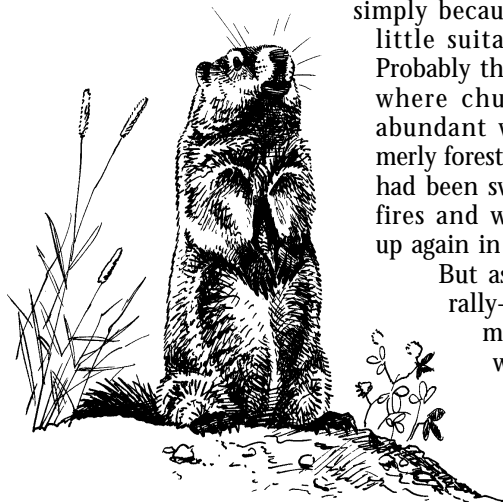
A few chucks are affected by malocclusion, which occurs when the front incisors fail to meet and therefore can't continually grind each other down. A rodent's teeth never stop growing, so this misalignment may result in an incisor growing in a complete circle, sometimes even penetrating the skull cavity and killing the animal.

Population

The woodchuck is one animal that has benefited from civilization. When our state was wilderness — when the land was almost completely forested and there were no farms, pastures or orchards — there were far fewer wood-

chucks than there are today, simply because there was little suitable habitat. Probably the only places where chucks became abundant were on formerly forested tracts that had been swept clear by fires and were growing up again in brush.

But as these naturally-cleared areas matured, woodchuck numbers would have dwindled; popula-



tion size depends on habitat, and while woodchucks can exist in wooded territory, they don't build up sizable populations there. By cutting forests, raising crops and clearing pasture land, settlers provided suitable habitat and the woodchuck population expanded. Today the chuck is one of our most common mammals.

Woodchuck numbers vary from area to area, depending on food availability, soil type, hunting pressure and predation. Sometimes populations are extremely dense, with up to six or seven individuals per acre; this high density is seldom reached. A population of four per acre is considered abundant, and the average is probably closer to one per acre of farmland.

In some regions, woodchucks are under heavy hunting pressure but still produce high populations year after year. This illustrates how a game species can absorb heavy local losses if it has enough good habitat. Chucks can damage crops and gardens and become real pests in agricultural areas where they are overabundant.

As a species, the woodchuck has a large range, extending north and northeast from Oklahoma and Alabama, and west across Canada into Alaska. The yellow-belly marmot, closely related to the woodchuck, inhabits the high country of the Rocky Mountain states.

Habitat

Woodchucks live in many types of terrain, from farmland and old, overgrown cemeteries to orchards and suburban areas. Ideal habitat might be a thick, almost impenetrable fencerow bordering cultivated cropland. Orchards, especially if the spaces between trees are not mowed frequently, provide good habitat; woodchucks dig burrows under dead stumps or at the bases of the trees, where the roots protect den entrances. In stony areas, dens are often dug under large rocks.

A chuck may dig its burrow in the center of a field or pasture, but usually the animal chooses a more protected location such as a field edge, fence, hedgerow or under a stone wall. Apparently, chucks do not require ground water sources as many live far from streams, lakes, creeks and other bodies of water. Like rabbits, they get moisture from succulent plants, dew and water left standing after rainfalls.

As well as requiring habitat, woodchucks provide it with the tunnels they dig. Skunks, raccoons and foxes remodel vacant burrows and use them to bear and raise young. Foxes may claim a burrow after killing its woodchuck owner. Rabbits often seek shelter in the dens, especially during winter while the chucks are hibernating below. Animals pursued by predators or hunters also use the burrows as escape hatches.

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Wildlife Note — 21
LDR0603

Woodcock

by Chuck Fergus

The American woodcock (*Scolopax minor*) is known by a host of folk names: timberdoodle, night partridge, big-eye, bogsucker and mudsnipe. It's a strange little creature with big eyes and a bill that looks too long for its body. Most active at dusk, night and dawn, a woodcock uses its bill to probe rich soil for earthworms, its favorite food.

Woodcock are migratory. While a few birds from farther north may wait out an exceptionally mild winter on Pennsylvania's southern fringe, most timberdoodles pass through our state. They spend the cold months in the South — the Carolinas, Georgia and northern Florida west to eastern Texas and Arkansas, concentrating in Louisiana and southwestern Mississippi. In spring, woodcock return north.

Taxonomically, the species is placed in Order Charadriiformes, which includes gulls, oystercatchers, plovers, stilts, curlews, sandpipers, snipe, phalaropes and others. Within this large order, the woodcock belongs to Family Scolopacidae, a group of snipe and sandpipers with more than 80 species distributed over most of the world.

The American woodcock is closely related to the European woodcock (*Scolopax rusticola*). The Old World bird resembles its American counterpart and has a similar life history, but it's larger and almost twice as heavy.

Biology

A timberdoodle's plumage is an overall mottled russet and brown. The beige breast, back and sides are overlaid with black and browns; the forehead and crown are ashy gray to black, barred with gold. The short tail is a combination of brick-red and black, tipped with gray. Feet and toes are bare and gray- to flesh-colored.

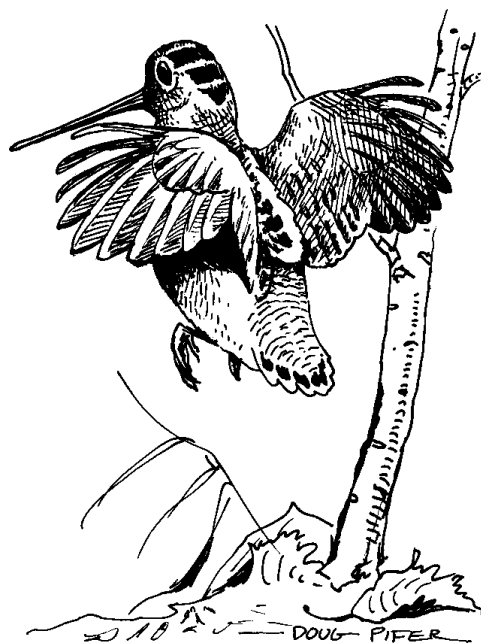
A woodcock is 10 to 12 inches in length (a little longer than a bobwhite quail), has a standing height of about 5 inches and a wingspread to 20 inches. Body conformation could be described as "chunky" — short and heavy, with a short, thick neck and a large head. Wings are short and bluntly rounded. Sexes look alike, although females generally average a bit heavier than males (7.6 vs. 6.2 ounces). Weights for both sexes vary according to time

of year.

A woodcock's bill is long and thin. A female's bill measures $2\frac{3}{4}$ inches or slightly longer, while a male's is usually less than $2\frac{1}{2}$ inches. Sensitive nerve endings in the lower third of the bill help a woodcock locate earthworms. A special bone-muscle arrangement lets the bird open the tip of its upper bill, or mandible, while it's underground. The long tongue and the underside of the mandible are both rough-surfaced to grasp and pull slippery prey out of the ground.

Eyes are large and set well back and high on the sides of a woodcock's head. Naturalists have speculated that this positioning lets the bird look all around — behind, above and to the sides, as well as ahead — while it probes for food. Nostrils are set high on the bill, close to the skull. A woodcock's ears are ahead of the eyes, between the base of the bill and the eye sockets. Hearing and sight are acute.

The woodcock's brain is unique among birds. Its cerebellum — which controls muscle coordination and body



balance — is located below the rest of the brain and above the spinal column. (In most birds, the cerebellum occupies the rear of the skull.) One theory suggests that, as the woodcock evolved, the eyes moved back in the skull, the bill lengthened, and the nostrils approached the base of the bill — adaptations that permitted ground-probing. As a result, the brain was forced back, and the mid-brain and hind-brain were pushed down and slightly forward. The woodcock of today, in essence, has an upside-down brain.

When woodcock flush from the ground, air passing through their rapidly beating primary wing feathers produces a whistling sound. The birds usually flutter up out of cover, level off and fly from 10 to several hundred yards before setting down. Being migratory birds, they are capable of sustained flight.

Food: Earthworms, high in fat and protein, make up about 60 percent of a woodcock's diet. An additional 30 percent is insects (ants, flies, beetles, crickets, caterpillars, grasshoppers and various larvae), crustaceans, millipedes, centipedes and spiders. About 10 percent is plant food, mostly seeds from bristleglass, panicgrass, sedge, ragweed, knotweed and blackberry. Timberdoodles do most of their feeding in the early evening and just before dawn. Digestion is rapid; an adult may eat its weight in worms each day.

Woodcock are quite vocal; naturalists have recorded and interpreted at least 10 separate calls. During the mating season, a male timberdoodle on the ground will sound a nasal, buzzing, insect-like note usually described as *peent*. Preceding each *peent* is a two-syllable gurgling note, *tako*. While the *peent* carries several hundred yards, the much softer *tako* is audible only within about 15 feet of the bird.

The flight song — a series of liquid, gurgling chirps — is sounded by a male trying to attract a mate. A male defending breeding territory against another male calls *cac-cac-cac-cac* as he flies toward his rival. A female will squeal and often feign a broken wing to lure intruders away from her young. Other calls express alarm or provide communication between hens and offspring. Migrating woodcock have turned up in Pennsylvania as early as February 25, but most don't arrive until the last two weeks in March. Migration is complete by mid-April.

Reproduction: In spring, males establish territories known as "singing grounds." These are woodland clearings spotted with low brush, or open fields next to brush or woods; they vary in size, but a quarter-acre seems big enough. While on the ground, the males *peent* to attract females. A male will take off and fly upward 200 to 300 feet on twittering wings; then he'll spiral or zig-zag back to earth, sounding a liquid, warbling song as he descends. Courtship occurs for short periods at dawn and dusk; it's most active when temperatures are above freezing and winds are calm.

Females seek out males on the singing grounds. Males may mate with several females. In Pennsylvania, most breeding takes place from early March to mid-May. Both sexes breed in their first year on the breeding grounds (before they're a year old).

Hens usually nest within 150 yards of the singing grounds where they mated; males play no role in nest selection, incubation or rearing of young. Favored nesting habitat includes damp woods near water, hillsides above moist bottomlands, old fields with low ground cover, briar patches, the edges of shrub thickets and young conifer stands. There may be little overhead cover (old fields) or up to 50 feet of vegetation (hardwood stands). The average cover height is 12 feet.

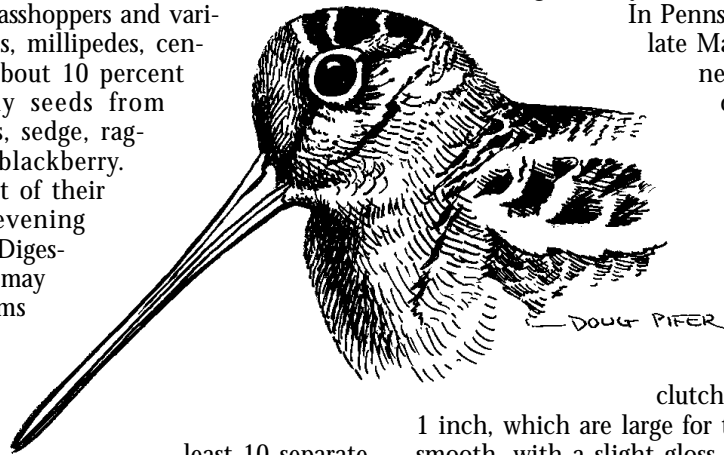
A typical timberdoodle nest is a slight depression on the ground in dead leaves. Some nests are rimmed with twigs or lined with pine needles. An egg-laying or incubating hen is difficult to spot, as her mottled, brown plumage usually blends in with the background.

In Pennsylvania, woodcock nest from late March into June. Located near nesting sites are feeding areas of open woods, abandoned fields, brushy areas and mixed forests, where incubating hens feed. Although they are solitary nesters, hens may share feeding grounds with other timberdoodles. A female lays one egg a day until she completes the normal clutch of four. Eggs are oval, 1½ by

1 inch, which are large for the bird's size. The shells are smooth, with a slight gloss, colored pinkish-buff to cinnamon and covered with light brown blotches overlaid with darker speckling.

Incubation takes 19 to 22 days. It begins after the last egg is laid, so all eggs receive equal incubation and hatch at about the same time. If a hen is disturbed early in the incubation period, she may abandon the nest. The longer she sits on the eggs, however, the less likely she will desert them. Toward the end of the incubation period, she may sit tight even when touched by a human's hand. Nest predators include domestic dogs and cats, snakes, skunks, opossums, raccoons and crows. Fires and flooding also destroy nests. Hens losing their first clutch may re-nest, often laying only three eggs. Eggs hatch from early April until mid-June, peaking in our state during the last week in April and the first week in May.

Chicks: Eggs split lengthwise (unique among birds) as the woodcock chicks emerge. Chicks are precocial, able to leave the nest a few hours after hatching. They're covered with fine down, pale brownish to buff with brown spots and stripes above, and rufous below; a dark line runs from the bill back to the eye. From the day of hatching, chicks "freeze" when threatened or in response to the hen's alarm call. During the first few days, the hen broods her chicks frequently, especially during rain, snow or cold. At first she finds worms for them, but after a few days, they are probing for and capturing worms by themselves.



Chicks grow rapidly. After two weeks they can fly short distances, and at the end of four weeks they're almost fully grown, fly strongly and look like adults. The family breaks up when juveniles are 6 to 8 weeks old. Adults undergo a complete feather molt during the summer; juveniles undergo a partial molt from July to October.

Migration: As days grow shorter and temperatures drop, timberdoodles begin to head south. Woodcock migrate at low altitudes (about 50 feet), flying at night and resting and feeding in secluded thickets during the day. They typically travel alone. Birds from farther north may start to pass through Pennsylvania in October; the migration peaks in late October and early November, with stragglers up until the end of November. Heavy northwest winds and cold nights may start large numbers of timberdoodles winging south.

Wildlife biologists believe that woodcock have several migration routes. Most woodcock nesting east of the Appalachian Mountains appear to winter mainly in the south Atlantic states. Woodcock breeding west of the Appalachians are thought to winter in Arkansas, Louisiana and other Gulf States. In spring, woodcock reverse direction and return north; like many migratory birds, they home strongly to the areas where they hatched.

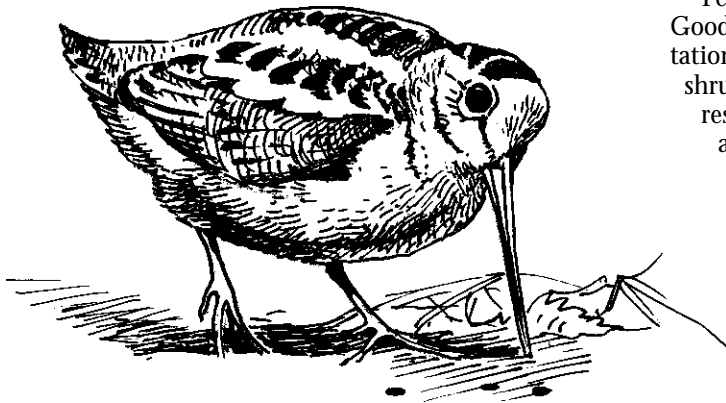
Woodcock are hardy and seem able to recover from injuries that would kill most other birds. If a timberdoodle reaches adulthood, its life expectancy is about 1.8 years. Banded wild birds seven years old have been recovered. Mortality factors include predators; accidents, many occurring during night flight; hunting; disease; parasites and bad weather. Woodcock heading north too early in spring may be caught by late-season snows or hard freezes, which seal off their food supply.

As migratory birds, woodcock fall under the jurisdiction of the U.S. Fish & Wildlife Service. This agency monitors the species' population and sets the framework for hunting seasons and bag limits.

Population

Compared to most other game birds, woodcock have a low potential productivity. A female raises only one brood each year, and each brood consists of four (and sometimes only three) young. Fortunately, the species has a high nesting success rate — 60 to 75 percent — and low juvenile mortality.

Population densities vary in any one locale. Woodcock



may be scattered, concentrated, or absent, depending on time of year, weather conditions or habitat. In autumn, concentrated groups of woodcock may not reflect the carrying capacity of land on which they're found, as they may just be passing through. The overall population can fluctuate greatly over the years. Steady human encroachment on wet woodland, timber maturation and flooding may pose threats to the woodcock population.

Woodcock may be exposed to pesticides used to control either forest or agricultural pests. Contamination from agricultural pesticides is highest in wintering areas where woodcock feed in farm fields. Earthworms are resistant to many chemicals, so they can carry toxins. Since woodcock are predators of earthworms, there's a chance they'll accumulate persistent toxic chemicals found in worms.

From 1968 to 1997, Pennsylvania's woodcock population had declined about five percent annually. That compares to a two percent average annual decrease over the same period throughout its North American range. Most biologists attribute this decline to loss of habitat quantity and quality. In Pennsylvania, intensive logging, farm abandonment and wildfires that create new and young forests — highly desirable woodcock habitat — are relatively rare today. Development also destroys or fragments existing woodcock habitat.

Habitat

Habitat requirements for woodcock change throughout the year. In spring, they need areas for courtship and nesting; in summer, for brood-raising; during fall and spring migrations, for feeding and resting; and they require wintering habitat in the southern states. Food must be available during all seasons.

Woodcock are attracted to moist forestland in early stages of succession. They tend to use edges rather than interiors of big, even-aged thickets. The following plants make land more attractive to timberdoodles: alder, aspen, hawthorn, gray dogwood, crab apple, blue beech and gray birch. These species can be planted or, if they already grow in a given area, encouraged by cutting down large trees which may be shading them and stunting their growth. For courtship, males need singing grounds — clearings a quarter-acre or larger, with a straight, unimpeded take-off strip 15 to 20 yards long. As trees and shrubs in the clearing grow larger, woodcock will seek out other areas; to keep a singing ground functioning, it must be cleared periodically.

Females nest and raise broods near breeding grounds. Good cover includes edges of thickets, young conifer plantations and old, brushy fields. The best feeding areas are shrub patches near streams, springs or marshy ground; resting cover often is on high, drier ground. Feeding and resting cover is used by hens and broods, males and migrating timberdoodles.

The life of good woodcock cover is about 20 to 25 years in Pennsylvania. As the cover matures, different tree species take over, and it grows less suitable. Over-mature aspen and alder tracts can be cut or burned; the resulting shoot growth will restore good habitat.

Wildlife Notes

Allegheny Woodrat	Opossum
Bats	Otter
Beaver	Owls
Black Bear	Porcupine
Blackbirds, Orioles, Cowbird and Starling	Puddle Ducks
Blue Jay	Raccoon
Bobcat	Rails, Moorhen and Coot
Bobwhite Quail	Raptors
Canada Goose	Ring-necked Pheasant
Chickadees, Nuthatches, Titmouse and Brown Creeper	Ruby-throated Hummingbird
Chimney Swift, Purple Martin and Swallows	Ruffed Grouse
Chipmunk	Shrews
Common Nighthawk and Whip-Poor-Will	Snowshoe Hare
Cottontail Rabbit	Sparrows and Towhee
Coyote	Squirrels
Crows and Ravens	Striped Skunk
Diving Ducks	Tanagers
Doves	Thrushes
Eagles and Ospreys	Vireos
Elk	Vultures
Finches and House Sparrow	Weasels
Fisher	White-tailed Deer
Flycatchers	Wild Turkey
Foxes (Red & Gray)	Woodchuck
Gray Catbird, Northern Mockingbird and Brown Thrasher	Woodcock
Hérons	Wood Duck
Kingfisher	Woodpecker
Mallard	Wood Warblers
Mice and Voles	Wrens
Minks & Muskrats	
Northern Cardinal, Grosbeaks, Indigo Bunting and Dickcissel	

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Wildlife Note — 13
LDR0103

Woodpeckers

by Chuck Fergus

A drumroll at dawn, a bird in undulating flight through the forest, wood chips littering the ground at the base of a tree — all these signal the presence of a woodpecker, a highly specialized and important member of nature's highly complex world.

Woodpeckers have been around for a long time: their fossil remains date back 25 million years and they're widely distributed, with 45 species in the US and more than 200 worldwide. Nine species either live year-round in Pennsylvania or visit the state in winter. The common flicker (yellow-shafted phase), pileated woodpecker, red-bellied woodpecker, red-headed woodpecker, yellow-bellied sapsucker, hairy woodpecker and downy woodpecker are residents. The black-backed (Arctic) and northern (American) three-toed woodpeckers have been known on rare occasions to get this far south in the winter.

The woodpecker family, Picidae, fills a unique niche in the food chain. Woodpeckers drill into trees to un-

cover insect food, to create nesting shelters and to communicate with other woodpeckers. Several body adaptations make this drilling possible.

A woodpecker has a sharp, stout bill with a chisel-like tip for chipping and digging into tree trunks and branches. In pecking out wood, the bird aims

blows from alternating directions — much like a wood chopper does. Bones between the beak and the unusually thick skull are not as rigidly joined as they are in other birds. Spongy, shock-absorbing tissues connect these flexible joints; strong neck muscles provide force for drilling; and bristly feathers shield the nostrils from dust and wood chips.

The tongue of most woodpecker species is round, horny and rich in tactile cells. The tip is pointed and barbed. After chopping exposes a woodborer's cavity, the long, flexible tongue feels out, impales and withdraws the larvae. The tongue is nearly twice as long as its owner's head and winds around the inside back of the skull when retracted.

To grip trees, a woodpecker has short, muscular legs and sharply clawed feet. On most species, two toes point forward and two backward. This opposed, "yoke-toed" arrangement lets a woodpecker climb with ease. Stiff, pointed tail feathers catch on the rough bark to brace the hammering body. During molt, the two middle tail feathers (the strongest ones) do not fall out until the other 10 have been replaced and can support the bird's weight.

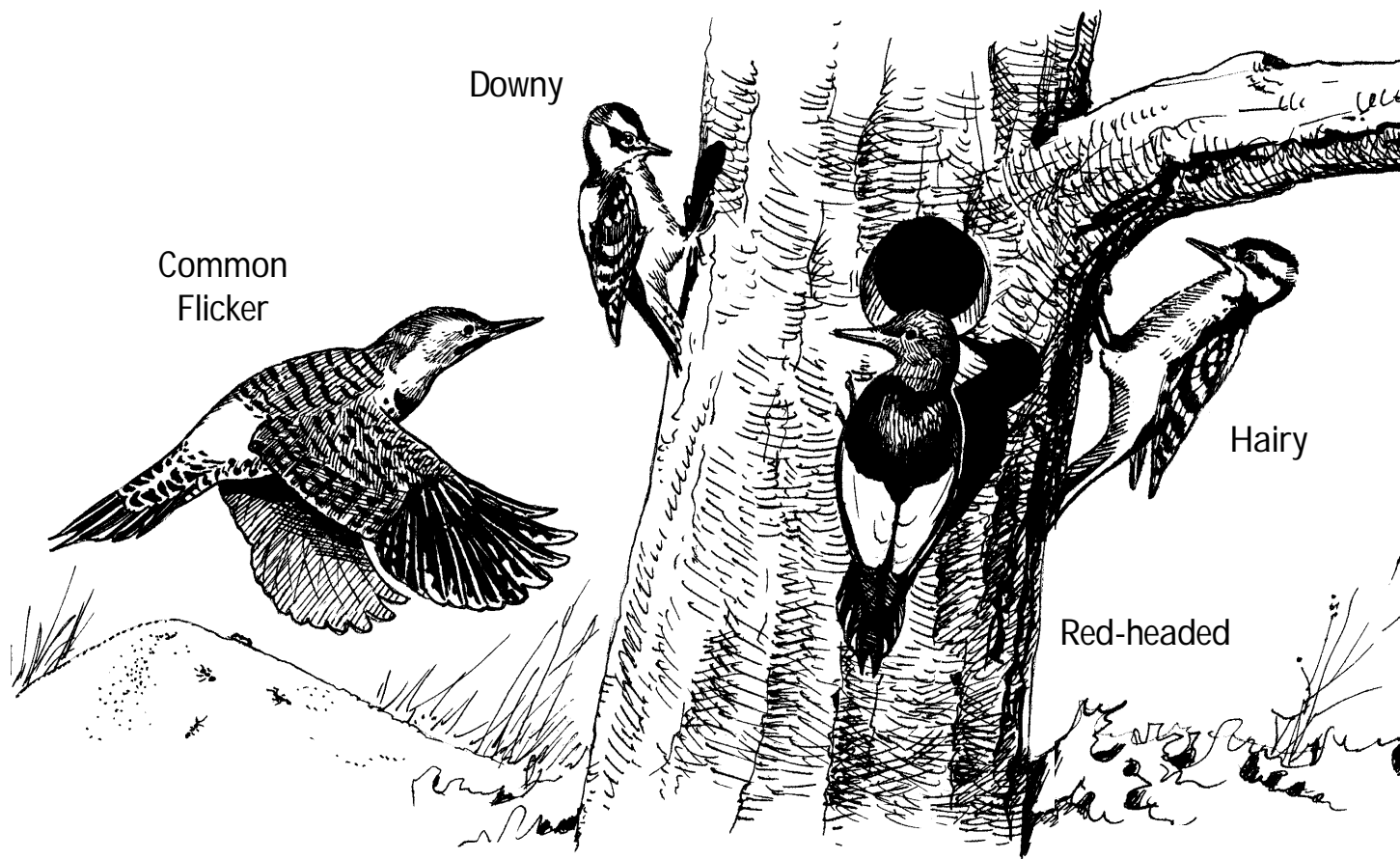
A woodpecker's flight is undulating. The bird usually launches off the side of a tree, pumps its wings four or five strokes, and folds them against its body. During this short pause, the bird loses a few feet of altitude. Then more wing beats to gain altitude, another pause, and so on.

Woodpeckers feed mainly on wood-boring grubs, insects, insect eggs and pupae. They also consume sap, nuts, and the fruits of some trees and shrubs. Hollow sounds — echoes of the woodpecker's tapping — probably signal the location of a wood borer's channel, and the bird drills up to 100 strokes per minute to uncover the morsel. Even in winter they have no trouble locating insects.

Most woodpeckers "drum" on resonant limbs, hollow tree trunks, drainpipes, garbage can lids, tin roofs, etc. Drumming designates territory and can attract a mate.



Downy



Soft tapping may be a type of communication between mates, or between parents and offspring.

Courtship and nesting habits are essentially alike in all woodpeckers. Much of the rivalry between males is confined to noisy, chattering pursuit. After pair formation, both sexes excavate a nest cavity in a branch or tree trunk. The female usually lays the white, unmarked eggs directly on wood chips left in the bottom of the cavity. Both sexes incubate, with the more aggressive male often staying on the eggs overnight. Young are altricial; for two to three weeks they remain in the nest and are fed predigested food by their parents. In the southeastern states, woodpeckers may raise two broods.

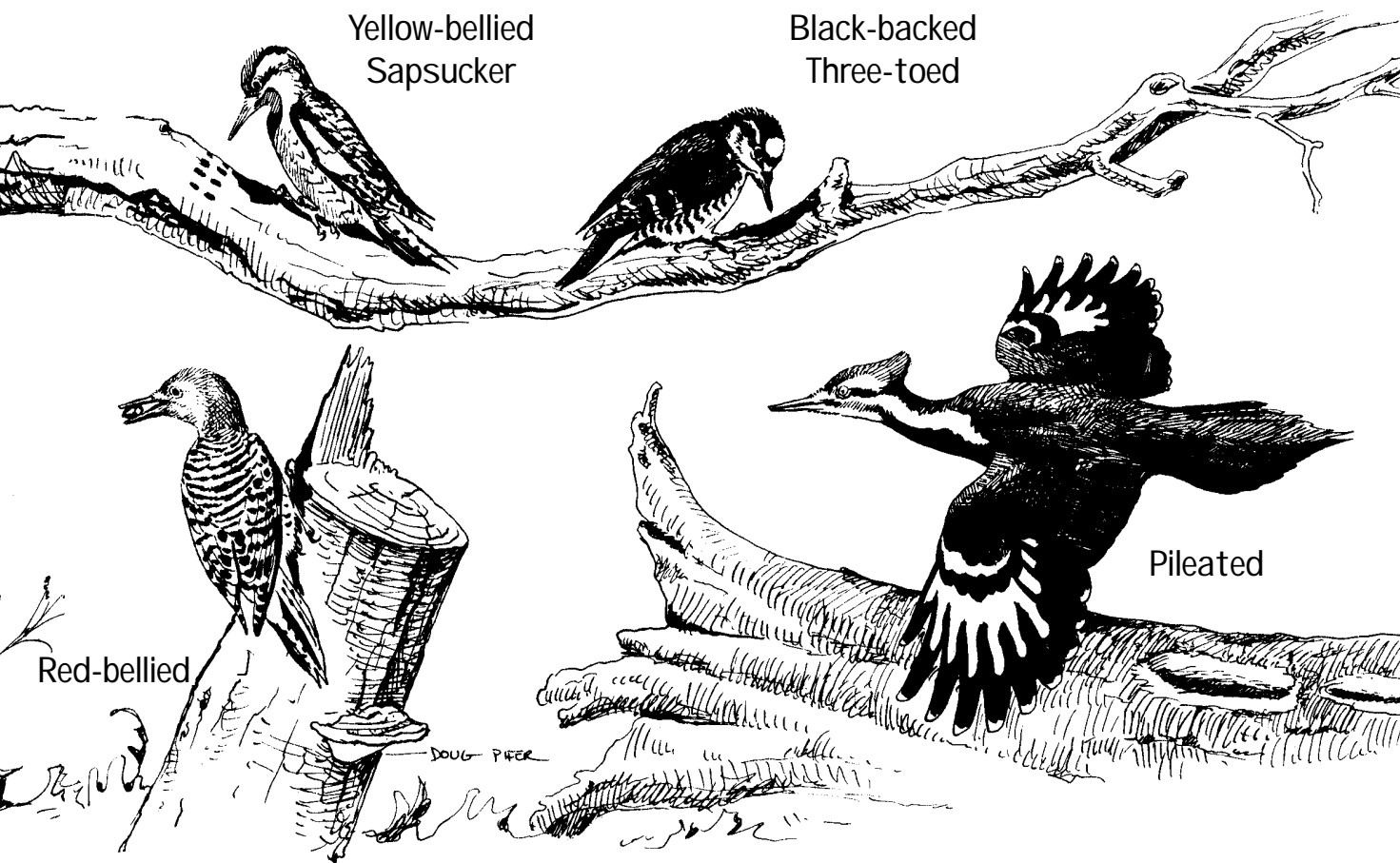
Woodpeckers have definite economic importance. They do punch holes in trees, but rarely in healthy ones. By stripping the bark from a dead or dying tree and cleaning up the resident wood borers or carpenter ants, they prevent these pests from spreading to nearby healthy trees. Woodpeckers also chop out homes for owls, bluebirds, tree swallows, nuthatches, chickadees, red and gray squirrels and flying squirrels. Adversely, woodpeckers sometimes damage utility and other poles.

The Pennsylvania Game Commission manages state game land woodlots and forests with the needs of woodpeckers — and wildlife — in mind. When marking tracts scheduled for timber cutting, PGC foresters leave a proportion of food-bearing trees and shrubs, as well as "wolf" trees (older trees, often dying, which do not make good

lumber). Wolf trees have many limbs and cavities that provide shelter and nesting space for many species of wildlife.

Red-Headed Woodpecker (*Melanerpes erythrocephalus*) — Length, 8 - 9 inches; wingspread, 18 inches. The head of an adult of this species is scarlet, and that of a juvenile, brown. Body plumage is black and white, with a large white wing area visible when the bird flies. Like the flicker, the red-headed woodpecker does a lot of feeding on the ground. It eats beetles, ants, grasshoppers, caterpillars and other insects, along with acorns, corn, wild fruits and apples. Redheads store acorns in tree cavities during winter and defend these food caches against squirrels and other birds. Habitat is open forestland, farm woodlots, towns and parks. This bird often perches in the open. Nest: 8 - 80 feet up, often in an oak and occasionally in a fencepost. Starling competition for nesting sites may be reducing this species' numbers. Eggs: 4 - 7, usually five, with a 14-day incubation period. In spring, the redhead is an uncommon migrant in late April and early May; in summer, a breeding resident; in fall, an uncommon migrant from September to early November; and a winter resident. Call is a raucous kwrrk.

Yellow-Bellied Sapsucker (*Sphyrapicus varius*) — Length, 7 - 8 inches; wingspread, 14 inches. Plumage varies within the species, but the narrow longitudinal wing



stripes — visible when the bird is at rest — and the finely mottled back are good field marks. (The back coloration blends well with tree bark.) The belly is tinged yellow, and the head is red, black and white. Sapsuckers drill parallel rows of holes in live trees (up to 30 holes per day) and return later to drink sap and catch small insects attracted to the sweet liquid. The bushy tongue of a sapsucker effectively soaks up sap. Other foods include beetles, ants, caterpillars, insect eggs, spiders; the cambium (layer beneath the bark) of maple, aspen, birch, fir, hickory, beech, pine, oak and other trees; fruits and seeds.

Sapsuckers inhabit forests, orchards and woodlots. Nest: a gourd-shaped cavity excavated 8 - 40 feet up a tree; aspen and other trees afflicted with tinder fungus are often chosen as nest sites, because the fungus creates a soft center that is easily dug out. Eggs: 4 - 7, usually five or six, with a 12- to 13-day incubation period. The sapsucker is the most migratory of our woodpeckers. In spring, it is a common April migrant; in summer, a rare breeding resident (breeds mainly across the northern US and southern Canada); in fall, a common migrant in September and October; and in winter a rare resident, as most individuals move farther south. Call is a jay-like mewing note. Also, sapsuckers tap in a distinctive rhythm, two or three series per minute; they do not drum.

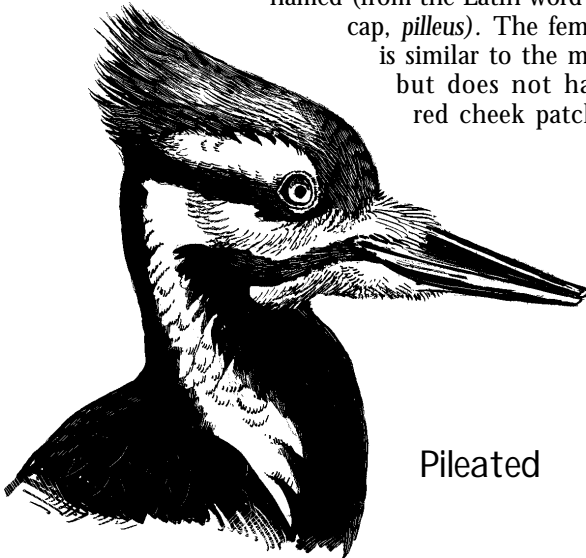
Hairy Woodpecker (*Picoides villosus*) — Length, 8 - 9 inches; wingspread, 15 inches. This woodpecker has a

vertical white stripe down the center of its back, black wings stippled with white on the upper sides, white feathers forming the outer edge of the tail and white breast. Sexes are similar, but the female lacks the male's small red patch on the back of the head. Larger size and a proportionately longer bill distinguish it from the downy woodpecker. The hairy eats beetle larvae, ants, caterpillars, adult beetles, spiders, etc.; also seeds and fruits. Primary habitat is forest land and wooded swamps. Nest: 5 - 30 feet up; the male may also dig a roosting cavity. Eggs: 3 - 6, commonly four, with a 12-day incubation period. The hairy woodpecker is found throughout the eastern US; in Pennsylvania, it is an uncommon resident in all seasons.

Common Flicker (*Colaptes auratus*) — Length, 8 - 10 inches; wingspread up to 20 inches (about the size of a blue jay). Flickers, also known as yellow hammers, have brown backs, no white on the wings, a prominent black band high on the breast, and bright red on the nape of the neck. The male has a black "mustache" mark extending from the bill back onto the throat. In flight, the white rump patch and yellow underwings show up well. Flickers are often seen on the ground or on sidewalks eating ants, a preferred food. Their saliva neutralizes the formic acid which ants contain. They also eat beetles, grasshoppers, crickets and other insects. In fall and winter, they eat poison ivy fruits, berries, corn and sumac seeds. Favored habi-

tat is woodland, orchards, woodlots and yards. Nest: a hole opening into a cavity, 2 - 60 feet up a tree. The cavity takes up to two weeks to build. Eggs: 3 - 10, usually 6 - 8, with an 11- to 12-day incubation period. Starlings may drive flickers out of their newly-dug cavities. In spring, flickers are common migrants from March to April; in summer, breeding residents (they breed east of the Rockies and across Canada and Alaska); in fall, common September or October migrants; and in winter, rare residents. Flickers winter principally in the southern US. Call: a loud *flick* or *flicker*, 2 - 7 times per minute; also a shrill, descending *kee-oo*.

Pileated Woodpecker (*Dryocopus pileatus*) — Length, 12 - 17 inches; wingspread, up to 27 inches; crow-size but with a long, slender neck. The largest American woodpecker (except for the rare, if not extinct, ivorybill woodpecker). Also called the Indian hen and log cock, a pileated woodpecker has a solid black back and tail and a conspicuous red crest for which it is named (from the Latin word for cap, *pilleus*). The female is similar to the male but does not have red cheek patches



Pileated

and has less red in the crest. Flight is strong, with irregular wing flapping accompanied by white flashing of wing undersurfaces. Foods include ants, beetles, wood-boring larvae and wild fruits. Pileated woodpeckers inhabit mature coniferous and deciduous forests, valley woodlots and remote mountain territory. Nest: a new hole excavated each year in the same nest area, 15 - 70 feet up (average 45 feet). The entrance hole is usually oval, and the cav-

ity is 10 - 24 inches deep. Eggs: 3 or 4, incubated 18 days. These birds are uncommon residents in all seasons. They do not migrate but breed all over the eastern US and Canada. A pileated's powerful beak can break loose fist-size chunks of wood; the bird twists its head and beak as it strikes to add leverage. Pileateds cut large rectangular holes in dead trees, spars, live conifers and utility poles. They drum loudly and rapidly, then more slowly, trailing off softly at the end. Call: *wick-uh wick-uh wick-uh*, in a series; also *kuk, kuk, kuk, kuk-kuk-kuk*.

Red-Bellied Woodpecker (*Melanerpes carolinus*) — Length, 8 - 9 inches; wingspread, 17 inches. This woodpecker has a "ladder back" (a pattern of black and white bands like a ladder), red cap and back of neck, and a breast tinged a very light red. The female's crown is gray, the immature's entire head is brown, and the male's crown and neck are red. Foods: acorns, beechnuts, hickory nuts, grapes and corn; mulberry, poison ivy and dogwood fruits; beetles, wood-boring larvae and ants. Red-bellied woodpeckers inhabit coniferous and deciduous forests, woodlots, orchards and yards. Nest: 5 - 70 (usually less than 40) feet up a tree or utility pole. Eggs: 3 - 8, commonly four or five, with two weeks incubation. Uncommon residents in all seasons, red-bellied woodpeckers mainly occur in the southern half of the state and along the western border. They're more common south and west of Pennsylvania. Call: a low, hoarse *chuh chuh*; also a rattling noise.

Downy Woodpecker (*Picoides pubescens*) — Length, 5 - 6 inches; wingspread, 11½ inches. The downy — most common of the eastern woodpeckers — resembles a small hairy woodpecker, with a similar white back stripe and white breast. The male has a red patch on the back of his head, similar to that on the hairy. Bill length of the downy is less than the width of its head, while that of the hairy is equal to or greater than the width of its head. The downy's outer tail feathers are barred with black (in the hairy woodpecker, these are solid white).

Food: wood-boring larvae, moths, beetles, ants, aphids, spiders, poison ivy and dogwood fruits, berries, corn, apples and acorns. Habitat: open forests of mixed growth, orchards, suburbs and parks. Nests are usually dug in rotting wood, 3 - 50 feet above the ground and often on the underside of an exposed limb. Eggs: 3 - 6, usually four or five, incubated 12 days. The downy woodpecker is a common resident in all seasons. In winter, it can often be found in fields with dried corn stalks, or visiting suet feeders. Calls: a soft *pik* and a rattling sound.

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Wildlife Note — 52
LDR0103

Wrens

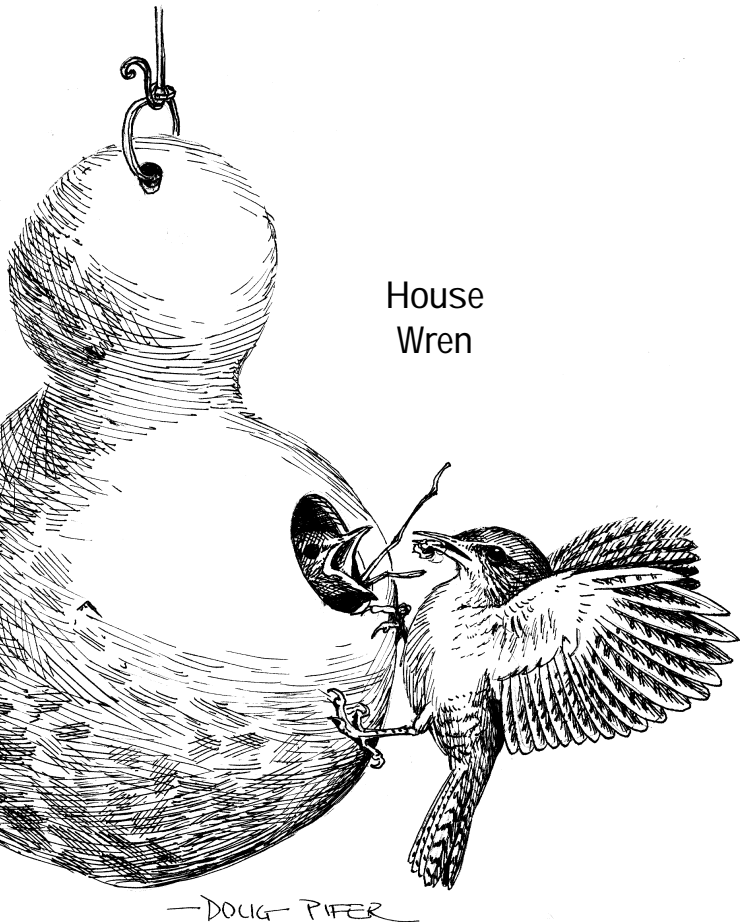
by Chuck Fergus

Wrens are small, active birds, basically brown in color, that often perch with their tails held straight up. They forage on or just above the ground in thick brush, forest understory or marsh vegetation. Wrens belong to Family Troglodytidae, with about 70 species in the New World, most of them in the tropics. Only one species lives in the Old World: the winter wren, which likely spread from Alaska to Siberia and extended its range westward until, eons in the past, it reached Britain and Iceland.

Some wrens nest in cavities; others build roofed structures out of plant matter. The males of several species build “dummy” nests, preliminary nests placed in tree cavities, woodpecker holes and nest boxes, and less frequently in odd enclosed spaces such as tin cans, pockets of clothing hung outdoors, hats, boots, flower pots and drainpipes. Later, a female will choose one of the male’s dummy nests, finish its construction, and lay eggs in it. Wrens often pester other birds and evict them from nest cavities, puncturing their eggs or pecking their young to death. They destroy nests in cavities and in the open; they also wreck other wrens’ nests. Why such belligerence? Does an abundance of empty nests discourage predators from looking further and finding an active wren’s nest? Or does killing its rivals’ offspring reduce pressures on prey populations, making it easier for a wren to feed its own young?

Wrens eat mainly insects and spiders. A few species will also feed on berries and seeds. Owls, small hawks and house cats take adult wrens; raccoons, opossums, minks, weasels, mice, squirrels, woodpeckers and snakes raid wrens’ nests. Some wrens migrate southward in winter, while other species remain as permanent residents on their breeding range. Five species are found in Pennsylvania.

House Wren (*Troglodytes aedon*) — The most common wren in Pennsylvania, this bird was named because it often lives around humans’ dwellings. A house wren is five inches long and weighs a third of an ounce. Its overall color is gray-brown. House wrens live in open shrubby woodlands, small woodlots, woods edges, towns, suburban backyards and city parks. They feed on insects, spiders, millipedes and



House
Wren

snails. The species breeds across southern Canada and the United States. Individuals from the East winter mainly in Georgia and Florida.

Males arrive on the breeding grounds in late April or early May. They establish territories of one-half acre or larger and advertise for females with a rich, liquid song. Males build dummy nests out of twigs in tree cavities, nest boxes or hollow fence posts; one male may construct up to seven such nests, defending them and the space around them. When building dummy nests, house wrens may destroy the nests and young of tree swallows, chickadees, bluebirds and prothonotary warblers. Females either arrive later than the males or stay hidden in brush until they begin inspecting the males’ territories. If a female finds a territory to her liking, she will finish one of the male’s dummy nests by adding a lining of grass, plant fibers, rootlets, feathers and animal hair.

In May, the female lays five to eight eggs, which are white

Carolina Wren



and speckled with reddish brown. She incubates them for 12 to 15 days. After the eggs hatch, the male helps with feeding the young, bringing grasshoppers, crickets, caterpillars and spiders to the growing nestlings. About two weeks after hatching, the young leave the nest. Females typically produce two broods per summer, rarely three. A female may abandon her first brood soon after the young have fledged, leaving the male to rear them; she may then move to another male's territory, mate again, and lay a second clutch. A male house wren may mate with two or more females in his territory, although he will usually help only the primary female raise her young. A "floater" is an unmated male who enters an established territory and tries to drive away the resident male or mate with the female. If he succeeds in taking over a territory, he may destroy the female's eggs or young. At that point, she will usually renest.

Most house wrens leave the breeding range in September and early October. They migrate by night; some are killed when they collide with communications towers. On their southern wintering grounds, they forage in thick brush. The oldest house wren on record lived seven years, but most individuals probably survive for only a year or two. Ornithologists believe the species has been expanding southward since European settlement began: the house wren benefits from forest fragmentation and does well in towns and residential areas.

Carolina Wren (*Thryothorus ludovicianus*) — The Carolina wren inhabits the eastern United States and Central America. It is a permanent resident wherever it breeds. At 5½ - 6 inches long, and weighing 0.7 ounces, it is the largest of our wrens. Carolina wrens are colorful birds with rusty-brown upper plumage, a buffy or cinnamon breast and a white stripe above each eye. They prefer moist or bottomland woods with moderate to dense shrubby

or brushy cover; they also inhabit gardens and yards. Carolina wrens forage mainly on the ground, often near downed trees or brush piles, using their curved bills to lift up leaf litter and snatch prey. They also climb up tree trunks like creepers or nuthatches. Carolina wrens catch caterpillars, chinch bugs, beetles, leafhoppers, grasshoppers, crickets, katydids and many other insects. They eat seeds of poison ivy, sumac, smartweed and other herbaceous plants, plus fruits and acorns.

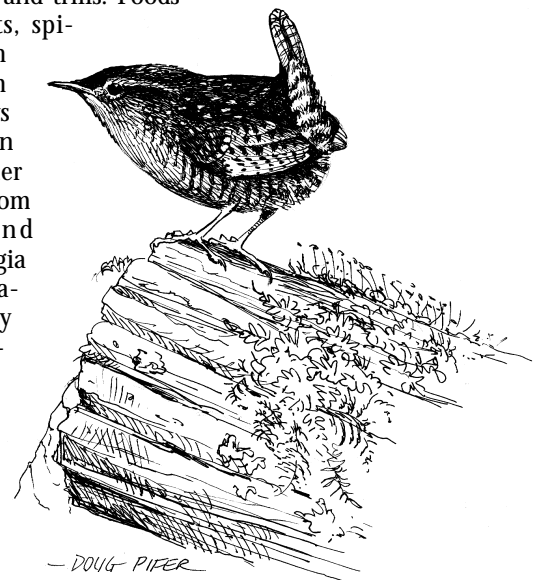
Unlike the house wren, the Carolina wren is monogamous. Pairs often forage together and defend a territory year-round. The species has a clear, ringing song, *tea-kettle, tea-kettle, tea-kettle*, which it may give year-round. Carolina wrens nest in tree cavities, bird houses, crevices in stone walls, among exposed roots and in cracks or crannies in buildings. Using leaves, twigs and other plant materials, both sexes build a dome-shaped nest with a side entrance. The normal clutch is five or six eggs. Incubation is by the female and takes two weeks; the male feeds her on the nest. The young leave the nest about two weeks after hatching. Pairs usually raise two broods per year.

In the last century, the Carolina wren has been expanding northward. Pennsylvania is on the northern edge of the species' breeding range, which extends north after mild winters and ebbs south following harsh winters. Extended periods of ice and snow can devastate local populations. Bewick's wren (*Thryomanes bewickii*) is a similar-appearing species that bred in southern Pennsylvania until around 1976; since then, it has not been found nesting here.

Winter Wren (*Troglodytes troglodytes*) — At just over four inches in length, the winter wren is our smallest wren. Its plumage is dark brown, and its tail is stubby. Look for this secretive bird in deep woods, particularly hemlocks, where it forages in brush piles and ravines — behaving "more like a mouse than a bird," notes ornithologist Kenn Kaufman. The male's song is a series of warbles and trills. Foods

include insects, spiders, small fish taken from stream shallows and berries. In the East, winter wrens breed from Newfoundland south to Georgia in the Appalachians. They nest in cavities, and a brood of five to six young is the norm. Males may mate with more than one female.

Populations have been growing in

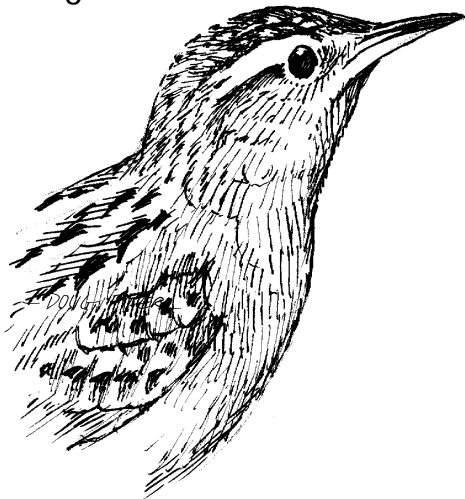


Winter Wren

Pennsylvania in recent years. Winter wrens head south in early fall, although some remain in the north and winter along streams and in swamps.

Sedge Wren (*Cistothorus platensis*) — This small (four and a half inches), shy wren inhabits moist upland sedge meadows with little or no standing water. It was formerly known as the short-billed marsh wren. Sedge wrens often breed in small colonies; Hal Harrison once counted 35 to 40 singing males on a 10-acre site. They may occupy a suitable habitat for several years, then disappear. Males sing a dry, rattling song. The actual nest is a ball of dried or green sedges woven into growing vegetation two to three feet above the ground. The usual clutch is seven eggs. A female generally produces two broods per year, and males may mate with more than one female. Surveys have shown that the sedge wren is rare and declining in the Northeast. *Cistothorus platensis* is listed as a threatened species in Pennsylvania.

Sedge Wren



Marsh Wren (*Cistothorus palustris*) — This is the typical wren of the cattail marsh. It is four and a half to five and a half inches long, its brown plumage marked with black and white stripes on the back and a white eye-stripe.

Marsh wrens arrive on the breeding range in late April or early May. The male's song is reedy and gurgling, lasts one to two seconds, and is given up to 20 times per minute, by day and at times by night.

Not particularly musical, it reminded one naturalist of "air-bubbles forcing their way through mud or boggy ground when trod upon."

The marsh wren forages on the marsh floor, flitting up and clinging to stalks and leaves of cattails, bulrushes

and other plants while searching for prey. It takes aquatic insects and their larvae, other insects, spiders and snails; often it nabs larvae from the surface of the water. Both males and females will peck and destroy the eggs of other birds in their territory; red-winged blackbirds often attack marsh wrens on sight. Males typically build dummy nests — around six for each breeding nest used by a female. The female weaves an oblong nest out of cattails, reeds and grasses, secured to standing vegetation. A short tunnel leads to a central cavity in which three to six eggs are laid. The female incubates the clutch for about two weeks. Fed by both parents, the young fledge after 12 to 16 days; the adults care for them for another two weeks. Two broods are produced each year. Male marsh wrens are polygamous: up to half of all breeding males may each mate with two or more females. Marsh wrens in the East winter along the Atlantic and Gulf coasts.

Marsh Wren



Wildlife Notes

Allegheny Woodrat	Opossum
Bats	Otter
Beaver	Owls
Black Bear	Porcupine
Blackbirds, Orioles, Cowbird and Starling	Puddle Ducks
Blue Jay	Raccoon
Bobcat	Rails, Moorhen and Coot
Bobwhite Quail	Raptors
Canada Goose	Ring-necked Pheasant
Chickadees, Nuthatches, Titmouse and Brown Creeper	Ruby-throated Hummingbird
Chimney Swift, Purple Martin and Swallows	Ruffed Grouse
Chipmunk	Shrews
Common Nighthawk and Whip-Poor-Will	Snowshoe Hare
Cottontail Rabbit	Sparrows and Towhee
Coyote	Squirrels
Crows and Ravens	Striped Skunk
Diving Ducks	Tanagers
Doves	Thrushes
Eagles and Ospreys	Vireos
Elk	Vultures
Finches and House Sparrow	Weasels
Fisher	White-tailed Deer
Flycatchers	Wild Turkey
Foxes (Red & Gray)	Woodchuck
Gray Catbird, Northern Mockingbird and Brown Thrasher	Woodcock
Hérons	Wood Duck
Kingfisher	Woodpecker
Mallard	Wood Warblers
Mice and Voles	Wrens
Minks & Muskrats	
Northern Cardinal, Grosbeaks, Indigo Bunting and Dickcissel	

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